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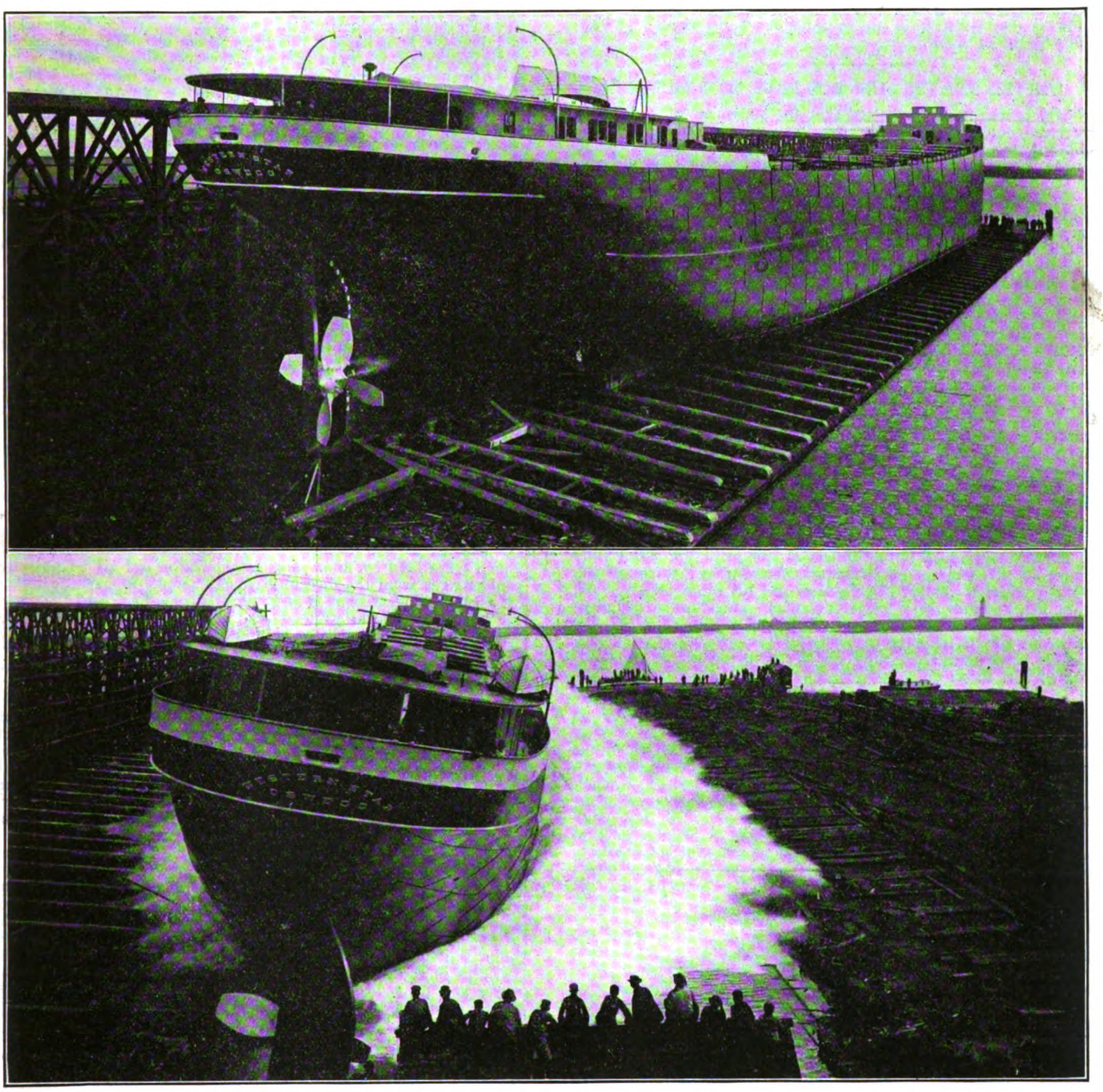
THE INDUSTRIAL SITUATION.

Everyone has a diagnosis for the present decline of stocks. Some are attributing it to the success of the United States Steel Corporation syndicate, and for this reason: This syndicate pledged itself for $200,000,000 and advanced only $12,500,000 in cash. Their principal was returned to them in a very few weeks and the profits declared upon the underwriting aggregated $50,000,000. There has never been a syndicate so profitable. It made various capitalists eager to become members of the underwriting syndicates and it is definitely known that several of them wrote themselves down for sums which they were really unable to subscribe. They did so on the assumption that they would not be called upon for the full amount, as in the case of the Steel Corporation, but that their profits on the other hand would be figured on the full amount of their subscription, as in the case of the Steel Corporation. But the Steel Corporation is one thing and succeeding enterprises are quite otherwise. In the case of the International Mercantile Marine Co. it became necessary to advance the entire amount of cash subscribed for and the same was true of the United States Realty Co. Many who subscribed did not expect this and in order to meet their obligations were forced to surrender fine securities at a sacrifice. Such are the penalties of forced liquidation; and while it is a mystery to the layman why millionaires should be compelled to let go of gilt-edged stock the above explanation is very simple indeed. A shrinkage in prices, such as this, has no bearing upon the value of the stock and does not in any way reflect the real condition of the country's business. There is no sense in taking a blue view of things merely because quotations have fluctuated violently. The action of the directors of the Steel Corporation in reducing by one-half the dividend on the common stock is recognized everywhere by conservative financiers as a



Launch of the Western Star at the Wyandotte Yard of the Detroit Ship Building Co. She is owned by Capt. M. J. Cummings, Oswego, N. Y.

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commendable thing; and it is denounced only by those whose cupidity gave heels to their judgment. The Steel Corporation is a very solid and substantial organization, and even in dull times its stockholders are less likely to suffer than those whose funds are invested in ordinary business pursuits. The Steel Corporation occupies a remarkable position. It is a little world in itself, and its various parts are so correlated that one practically affords a market for the other. It wrings a profit from every phase of its industry, and as it owns its own raw materials and the avenues of transporting them to the furnaces it can assuredly withstand fluctuations in prices better than rivals who must buy in the open market.

The revelations of the extraordinary methods employed to finance the United States Ship Building Co. cannot fail to have a bad effect. It is really unfortunate that this combination should have been projected at all, because the subsidiary plants were all of them healthy and well organized; but no industry could thrive with such a burden of fixed charges against it. It adds another illustration of the injurious consequences of suddenly acquired wealth.

UNITED STATES SHIP BUILDING CO'S MUDDLE.

Of course it was expected that the statement of Mr. Leroy Dresser, touched upon in the last issue of the Review, that the ship building stock held by the house of J. P. Morgan & Co. and by Mr. Charles M. Schwab should be marketed first, would create considerable of a sensation in Wall street. J. P. Morgan & Co. lost no time in denying it. A statement was issued that neither J. P. Morgan & Co. nor any partner were parties to such an agreement. It is known, of course, that Mr. Morgan himself was not in the country at the time and it is also known that when he returned he expressed his opinion that the ship building combination had been vastly over-capitalized. It is also known that he expressed his disapproval of the ownership of the Bethlehem Steel Co. by Mr. Schwab when that gentleman was also president of the Steel Corporation. Mr. George W. Perkins, who is the partner of the house of J. P. Morgan & Co. most closely associated with the deal, said that he was willing to be subpoenaed in the case if it was deemed needful to call him; but no one seemed to know where Mr. Schwab could be found. The latest information was that he was somewhere in the Adirondacks. Mr. Samuel Untermyer, who is the counsel contesting the foreclosure suit brought against the company by Charles M. Schwab, issued the following statement concerning the clamor against J. P. Morgan & Co.

"I have already said and repeat it that the creditors of the ship building company whom we represent have no grievance against J. P. Morgan & Co. There is nothing in their relations to the business which is the subject of just criticism, and I fully regret all this tempest in a teapot so far as they are concerned. "Our grievances against Mr. Schwab and his representative, Mr. Pam, are, however, very real and serious. It is toward establishing those charges, and not against Messrs Morgan & Co. that the testimony of Mr. Dresser is directed. The first mortgage bondholders claim that Mr. Schwab, under the guidance and inspiration of Mr. Pam:

"(1) Took control of the shipyards company in an irregular and unlawful way by means of a sale of the Bethlehem plant at an extortionate price and upon unconscionable terms;

(2) That having thus secured control the condition of the company was misrepresented to the stock exchange by the company's treasurer as one of great promise and prosperity, when it was at that time on the eve of collapse, and that this was done to induce investors to buy the securities;

"(3) That the large earnings of the Bethlehem Co., to which the shipyards company was entitled, and which were more than sufficient to pay the interest on the first mortgage bonds twice over, were withheld and refused by Mr. Schwab, and that it was this which brought about the collapse of the company;

"(4) That the default was forced by Mr. Schwab for the express purpose of enabling him to supplant the lien of the first mortgage bonds in favor of his second mortgage bonds through threats of foreclosure;

"(5) That Mr. Schwab's plan of reorganization, which announced the insolvency of the company, was the fruition of his scheme to corral the bondholders' property without paying for it.

"The bondholders claim that Schwab's $10,000,000 mortgage is void; that he is subject to a stock liability of $20,000,000 on stock for which he has not paid, and that the company can be made entirely solvent by the enforcement of the remedies against him for his acts. It is not for a moment suggested that Messrs. Morgan & Co. had any knowledge of or connection with any part of this scheme."

It is understood that Receiver Smith will, in his report, recommend that suit be brought for the recovery of the ship building company's stock from the original holders who did not pay for it in full. Under the New Jersey law an "original holder" of stock who did not give full value for it can be sued to recover the full value.

Further interesting details are expected when the hearing in the suit of the United States Ship Building Co. against the foreclosure proceedings is resumed. It is understood that a reference to the minutes of the board will show that early in April last Max Pam, one of the directors, presented to the executive committee a resolution, which was passed, calling upon the Bethlehem Steel Co., one of the constituent companies of the ship building combination, for the sum of $2,000,000 for betterments in the way of extensions and improvements in the Bethlehem plant. When this resolution came before the board of directors subsequently it was vehemently protested against by Mr. Nixon. He apparently realized his inability to prevail against the board, expressed his desire to go on record as urging that, in providing for such extensions and improvements, it should be made a condition of any such expenditure that proper provision should be made to safeguard the amount of $900,000, which amount was to be declared as a dividend by the Bethlehem company. He suggested, in addition, that a provision to that effect should be added to the resolution. But his effort was a signal failure. In the briefest sort of way the minutes state that the minutes and proceedings of the executive committee were unanimously approved, Mr. Nixon not voting.

In describing the situation in which the United States Ship Building Co. finds itself at this time, a man who has every reason to be conversant with the affairs of the organization said:

"Beginning at the beginning, as it were, of the troubles, it is best to call attention to the straits in which a majority of the ship building companies in this country were plunged in the recent past. The Cramp company needed money and had to get together $4,000,000 to right its affairs, requiring practically $2,000,000 to pay off its indebtedness; a prominent ship yard in New England went to pieces, and a lot of prominent men had to come forward to raise $2,000,000 to extricate a Camden company from its difficulties. These were some of the things which happened in the ship building branch of industry, and the reason for them was the long-time contracts taken by them before the present labor revolution began. The men had been working ten hours a day; they cut this to nine and a half, with a half-holiday on Saturday, and the troubles started. New York city has had an object lesson in this sort of thing in the cessation of work on the big steel buildings. The same conditions affected the ship building business. All the small margin contract profits turned to losses, making an average increase in cost of about 40 per cent. In the last year between $800,000 and $1,000,000 was made in the yards of the United States Ship Building Co. The Bethlehem Steel Co. made more than $2,000,000 in profits, making the actual profits of the ship building combination more than $3,000,000.

"Now the questions every one is asking are: Why did this great company permit itself to drift into its present condition? Why did it fail to pay interest on its bonds when the interest was only $362,000? The only money withdrawn was $250,000, which was taken out in February last to pay the interest on the Bethlehem bonds of Mr. Schwab, ten millions of which were held by him. Mr. Lewis Nixon did all he possibly could to get from the directors enough money to pay the interest on the ship yard bonds and failed lamentably. And that was the beginning of the strained relations between the representatives of Mr. Schwab and the United States Ship Building Co. In the directorate of that company the representatives of Mr. Schwab outnumbered Mr. Nixon eight to one practically. First of all in the directorate were: Max Pam, personal counsel to Mr. Schwab; Joseph Schwab, his brother; Mr. Baker, one of the officials of the United States Steel Corporation; Dr. Leslie Ward of New Jersey, a personal friend of Mr. Schwab's; Dr. Ward of Pittsburg, Mr. Schwab's private physician, and Messrs. McIlvaine, Borie and Johnson, the president, vice-president and general manager respectively of the Bethlehem Steel Co. All of these gentlemen were on the board by direct appointment of Mr. Schwab. The other two members of the board were Mr. Nixon, president of the organization, and Charles R. Hanscom, president of the Eastern Ship Building Co., who, it is understood, was with Mr. Nixon in the matter of opinion and vote.

"Mr. Nixon pleaded and demanded and used every effort to get the money to pay the interest on the ship yard bonds, but was met with distressing action. Nearly all of the other ship yards in the country had been going to pieces, but the United States Ship Building Co. turned up profits in the neighborhood of $800,000 in the last fiscal year. This was at a time of unusual stress and it showed earnings instead of losses, and that is admitted even by Mr. Schwab's reorganization committee."

The New York Times in its issue of Sunday last contained a great variety of letters from common stockholders of the United States Steel Corporation damning the directors of that corporation up hill and down for suspending the dividend on the common stock. Their bone of contention appears to be that they would never have bought the stock at all if they had not believed that it would continue to pay dividends. In other words the prospect of 10 to 20 per cent. for their money was too alluring for them to resist and it is merely another evidence that cupidity is a ruling passion. The directors did wrong, indeed, in declaring a dividend upon the common stock at all—that is they did the corporation wrong in doing so but they did no individual person wrong. No corporation, or set of corporations can be guardian for the general public. A man must use his own judgment in making investments and he should paste this truth in his hat, for it has the force of an axiom: Never buy common stock as an investment. Should liquidation come common stock has nothing to liquidate.

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PHILADELPHIA SHIPPING MATTERS.

Philadelphia, Oct. 15.—The Trades League of Philadelphia, one of the older and stronger business men's associations, put itself on record at its first fall meeting last week as being strongly in favor of the movement to dredge a 35-ft. channel in the Delaware. The league "favors the 35-ft. channel for the reasons that it will give access to League island and tend to improve that naval station; that it will aid marine construction on the Delaware and permit the largest vessels to go and come from the ship yards; that it will build up the international shipping interests between Philadelphia and foreign ports." The board of directors of the Commercial Exchange at their meeting last week also passed resolutions approving the cutting of a 35-ft. channel of adequate width. Still another strong association to endorse the channel project is the Merchants' & Travelers' association of Philadelphia. This recently-formed business association is composed of wholesale merchants and jobbers and their traveling representatives. Preliminary organization has been perfected and over $10,000 has been subscribed as a guarantee fund to prosecute the objects of the association, to wit, the general trade and business interests of the city. The Merchants' & Travelers' association has represented in its membership over 100 of the largest business houses in this city, and at a recent formative meeting the 35-ft. channel project was a leading topic. Representative men connected with all of the local ship yards are earnest advocates of the improvement and so too are many of the trade associations of Camden, Wilmington, Chester and other cities on the Delaware. The movement is receiving such unanimous support from all interested parties that it is confidently believed congress will grant the necessary funds for carrying out the work. The Port Wardens, at a regular meeting last week, adopted resolutions along the lines of those referred to above. In a communication read at this meeting it was shown that Capt. Sanford of the United States engineer corps, in answer to a question, said that he thought anything in engineering possible nowadays and that the channel project was only a question of cost and advantage to be derived.

Local ship building companies have declined to join similar concerns in New York in a concerted effort to protect their interests from what they designate as unjust demands of labor. Local ship builders assert that there is no necessity for them to unite in a stand against organized labor. Said one of the large ship builders: "The conditions in Philadelphia are such that the interest of the employer and employe harmonize more so than in other places and we have been comparatively free of trouble. The Delaware river ship yards, almost without exception are 'open' yards—'open' in the sense that union and non-union men are both given employment. In these 'open' shops there is usually steady work, fair wages and just treatment for all workmen. We have had few strikes or lockouts and in every strike that has taken place the strikers have lost."

The launching of the steamer Manchuria at the works of the New York Ship Building Co., which was anticipated for Oct. 15, through minor delays, will not occur until later in the month. Before the steel keel of the Washington was laid a vast amount of preliminary work had been done toward the construction of the cruiser, with the result that work once commenced, progress made has been seemingly swift. Repairs on the St. Louis are progressing at a satisfactory rate.

The tides in the Delaware varied from 2 to 9 ft. above normal height during the severe storms last week, and at the Cramp yard so flooded the dry docks, on which was the steamer Miami, that the hull was flooded and the vessel seriously damaged. Employes at the Hagen ship yard were unable to go to work; a vessel at this yard undergoing repairs was sunk and timber and small boats valued at $500 were swept away.

Construction work at the Cramp ship yards has been vigorously prosecuted for some time, outside work alone being held back a little by severe storms. The recently-launched Turkish cruiser Medjidie is so far completed that General G. B. Williams, representative of the Cramps, is at Constantinople arranging for the delivery of the cruiser to the Ottoman government.

The Western Electric Co. of 933 Market street, will erect at Eleventh and York streets a factory 170 by 240 ft. in dimensions. It will be of two and three story height. The Western company has built up a large business, much of it with local and other ship yards, and the new factory is designed to meet the demands of increased business.

The protected cruiser Denver, launched some time ago at the works of Neafie & Levy, will be given her trial off the Delaware capes on Oct. 22. Her builders are confident that the vessel will make the required speed of 16.5 knots. The Denver has a displacement of 3,100 tons, twin-screw propellers and engines of 4,700 I. H. P.

The four-masted schooner Elvira T. French, Capt. J. T. Murphy, made a new record last week, sailing from this port to New Bedford, Mass, with 1,500 tons of coal, and return, in nine days. This included the run down the river and up and the time of discharging cargo. It is the fastest time of which there is any record.

The French commerce destroyer Jurien de la Graviere was a visitor at this port this week and was a subject of interest in marine circles. The Graviere is a vessel of a type similar to the Columbia and Minneapolis, cost $2,379,865 and is manned by a crew of 500 officers, marines and seamen.

The training steamer Panther, formerly the Red Star liner Venezuela, has been ordered out of commission at the League Island navy yard. Officers and men are aboard the recently commissioned Minneapolis, but she will not leave the yard within three weeks.

SUMMARY OF NAVAL CONSTRUCTION.

The race between the Newport News Co. and the New York navy yard over the construction of the battleships Louisiana and Connecticut appears to be neck and neck. During the past three months the Louisiana has kept 6 per cent. ahead of the Connecticut. It is quite likely that this percentage will be increased as the months go by. The training brig, building at the Portsmouth navy yard, is 1 per cent. completed. The various torpedo boats show no perceptible gain. Following is the summary:

Name.	Building at	Degree of completion. Per Cent. Sept. 1.	Oct. 1.
Battleships.			
Missouri	Newport News Co.	97	98
Ohio	Union Iron Works	81	82
Virginia	Newport News Co.	42	44
Nebraska	Moran Bros. Co.	25	27
Georgia	Bath Iron Works.	35	36
New Jersey	Fore River Ship & Engine Co.	43	45
Rhode Island	Fore River Ship & Engine Co.	44	45
Connecticut	Navy Yard, New York.	15	18
Louisiana	Newport News Co.	21	24
Vermont	Fore River Ship & Engine Co.	0	0
Kansas	New York Ship Building Co.	0	3
Minnesota	Newport News Co.	1	3
Armored Cruisers.			
Pennsylvania	Wm. Cramp & Sons.	57	59
West Virginia	Newport News Co.	57	59
California	Union Iron Works.	39	41
Colorado	Wm. Cramp & Sons.	60	63
Maryland	Newport News Co.	55	57
South Dakota	Union Iron Works.	35	38
Tennessee	Wm. Cramp & Sons.	5	8
Washington	New York Ship Building Co.	4	6
Protected Cruisers.			
Denver	Neafie & Levy.	97	97
Des Moines	Fore River Ship & Engine Co.	92	94
Chattanooga	Lewis Nixon.	74	74
Galveston	Wm. R. Trigg Co.	68	68
Tacoma	Union Iron Works.	86	91
Cleveland	Bath Iron Works.	99	99
St. Louis	Neafie & Levy.	25	28
Milwaukee	Union Iron Works.	29	31
Charleston	Newport News Co.	48	50
Gun Boats.			
Dubuque	Gas Engine & Power Co.	3	7
Paducah	Gas Engine & Power Co.	3	6
Training Ships.			
Cumberland	Navy Yard, Boston.	0	0
Intrepid	Navy Yard, Mare Island.	0	0
Training Brig.			
Boxer	Navy Yard, Portsmouth, N. H.	1	1
Torpedo Boats.			
Stringham	Harlan & Hollingsworth.	95	95
Goldsborough	Wolff & Zwicker.	99	99
Blakely	George Lawley & Son.	99	99
Nicholson	Lewis Nixon.	99	99
O'Brien	Lewis Nixon.	98	98
Tingey	Columbian Iron Works.	96	96
Steel Tugs.			
Pentucket	Navy Yard, Boston.	85	87
Sotoyomo	Navy Yard, Mare Island.	67	82

SENATOR HANNA ON THE SHIPPING BILL.

Senator M. A. Hanna is devoting considerable of his time to a discussion of the shipping bill during the present political campaign in Ohio. He is listened to with profound attention and it is clear that the sentiment of his audiences is with him. Senator Hanna said that his interest was aroused in shipping when in 1897 he learned that the export trade of the United States had fallen from 80 to 8 per cent. He is urging the necessity of encouraging marine interests not only as a factor in building up industrial interests of the country but also as a means of providing an auxiliary navy. Of course, the ship building interests do not get a dollar directly under the bill. A certain mileage is to be allowed the ship for the carriage of American goods. Therefore the stimulus is directly to the ship and indirectly to the ship builder.

The sudden overflow of the Delaware river threatened the League Island dry dock with destruction last week. The water reached a higher point than has been reached for thirty years past. So suddenly did it come that 1,200 visitors at the navy yard were imprisoned. The dock sprung a leak in six places and an army of workmen was called to save it. After several hours' work the dock was reported to be out of danger.

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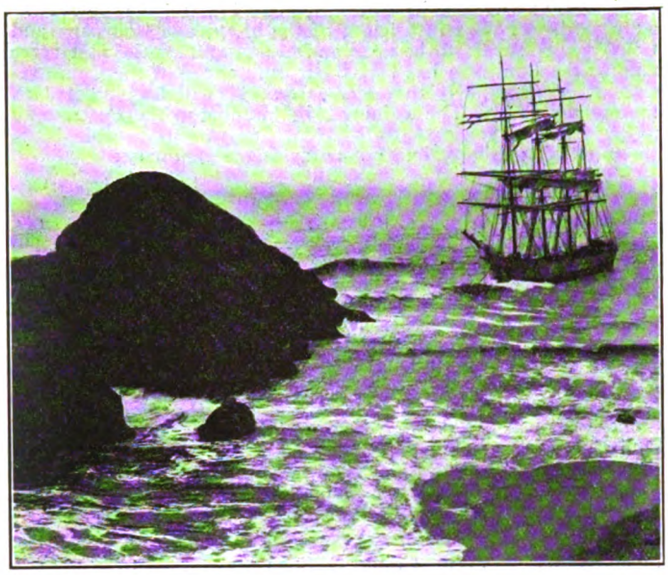
ENGLISH BARK GIFFORD ASHORE.

The approach to San Francisco harbor is extremely hazardous, owing to shallow water, rocky bottom and frequent fogs. The four-masted English bark Gifford went ashore in a fog on Sept. 25. She was seventy-five days out from Newcastle with



English Bark Gifford ashore off San Francisco.

a cargo of coal. She struck about 10 miles south of the entrance to the harbor and about 200 yards from shore. As soon as she went on the rocks the captain let go both anchors and the crew

The Gifford on the Bottom.

stood by all night. In the morning two boats were launched and the crew reached the shore in safety. The life-saving crew assisted in making the lines fast to vessels from tugs. Four tugs made an attempt at floating her but the lines parted and it was necessary to jettison her cargo before she could be got off. The accompanying views show the bark's position when she struck.

WHITE STAR LINE'S LAST REPORT.

In its last report to stockholders the Oceanic Steam Navigation Co. (White Star Line) admits that it is no longer an independent company, to the eminent satisfaction of Fairplay. The report reads:

"The change which has taken place in the ownership of the Oceanic Steam Navigation Co., Ltd., marks the termination of its career as an independent company, and the shareholders feel that they cannot allow the occasion to pass without placing on record their most grateful remembrance of the late Mr. T. H. Ismay, the founder and manager of that far-famed and most successful line, and their profound admiration of the energy and self-devotion with which he piloted it through its early trials and difficulties from its inception in the year 1869, and carried it to the high level of success and the proud position in the mercantile marine of the world to which it eventually attained before his lamented death. They also desire to record their sincere appreciation of the successful management of the company's affairs since the death of Mr. Ismay, by his son and successor, Mr. J. Bruce Ismay, who with his partners, Mr. Imrie, Mr. Graves, Mr. James H. Ismay and Mr. Sanderson, have maintained to the fullest extent the prestige and position which the line has so long held. The transfer of the ownership of the company on satisfactory terms, which has just been completed after nearly two years of difficult and protracted negotiations, forms the commencement of a new era in its existence, and the shareholders desire to record their keen appreciation of the way in which Mr. J. Bruce Ismay and his colleagues have brought these negotiations to a successful issue, and in which they have safeguarded the company's interests throughout."

ARRIVAL OF THE COLUMBUS.

By the arrival in Boston on Saturday, Oct. 10, of the Dominion liner Columbus, the efficient fleet of the International Mercantile Marine Co. was increased by the presence in service of the newest steamship afloat and the largest steamship ever entering Boston harbor. The Columbus completed her maiden voyage in 8 days, 8 hours and 33 minutes from Liverpool, or 7 days, 16 hours and 7 minutes from Queenstown, and that in a succession of stormy days with heavy head winds and sea. In spite of such conditions she established a record day's run of 426 miles. The Columbus is the product of the Queen's Island ship yard of Harland & Wolff at Belfast, the birthplace of her sister-ships in the Dominion and White Star service, and for her class she has no superiors. In construction the Columbus is quite similar to the Commonwealth of the same line, and though differing in dimensions is arranged on much the same general plan.

The Columbus is 587 ft. long over all, 67 ft. 6 in. beam, and 44 ft. deep. Her gross tonnage is 15,378, making her the largest vessel trading to Boston. The net register is 9,742 tons and her loaded draught is 34 ft. 1 in. The freeboard is higher than other vessels, it being 52 ft. from the water's edge to the awning deck, or 60 ft. to the upper bridge. The two quadruple-expansion engines driving the twin screws are of 9,100 I. H. P.; for these there are eight boilers, and the coal consumption for a 16-knot speed is 144 tons a day. Auxiliary engines throughout the ship furnish the power for lighting, ventilation, refrigerating, pumping, steering, hoisting.

The passenger accommodations are roomy and convenient, the extensive beam of the vessel permitting larger staterooms and wider passenger and deck-promenades. Accommodations are provided for 361 first-class, 442 second-class and 752 steerage passengers, according to English requirements. The steerage accommodations according to Italian laws are sufficient for 1,740 passengers. All the apartments are tastefully finished and comfortably furnished. The saloon dining room seats 200; the second-class dining room, 100; the third-class dining room, 1,500. Pleasant smoking rooms and ladies' rooms are provided for all classes. The quarters of the officers and crew are commodious and convenient, the offices being located on the bridge deck. The ship's complement calls for fifty-four officers and crew, sixty-nine engineers, 120 stewards and stewardesses.

The White Star Line having taken over the Boston fleet of the Dominion Line, the Columbus will be included, and under the new flag will be known as the Republic, and will be engaged in the Mediterranean service between Boston and Naples.

KAISER WILHELM CANAL STATISTICS.

It is well known that the construction of the Baltic, or the Kaiser Wilhelm canal, was due far more to strategical than to commercial considerations. No event has occurred to test its strategical importance, and from the commercial standpoint the practical working requirements of this great sea canal are not of an encouraging nature. The failure to make both ends meet does not spring from any diminution in the receipts, for they have steadily increased ever since the opening of the canal eight years ago. The expenses, however, have been likewise on an ascending scale. In the first place the general dimensions of the channel, especially at the station and passing places, have been found too restricted for the exigencies of a continually augmenting general traffic. At many points the curves are too sharp and the current and the draught of water become impeded by the incessant slipping of the earth down the slopes of the cuttings into the fairway. The canal is, neglecting fractions, 62 miles in length, and connects Brunsbottel, on the North sea, with the port of Kiel, on the Baltic. Along a great portion of the route the constructive masonry works have suffered considerably, more especially when situated below the water level, and resting upon a sandy foundation. On the other hand, the canal, except at the entrances, is perfectly unencumbered by locks and swing bridges, and all the machinery and appliances necessary for operating them. In winter the navigation is kept open by the employment of ice-breaking steam vessels. Fogs are of constant occurrence during a third part of the year, and the cause of numerous collisions and groundings. It should be stated that accidents of this character are much rarer now, since the establishment, in the year 1900, of an efficient pilot service. It will be unnecessary in order to show the development of the traffic on the canal to quote the authoritative statistics for each successive year. A comparison between the results obtained at the period when the whole undertaking was in full working order and those of last year will be more than sufficient for the purpose.

In the financial year terminating in 1898 the number of steamers using the waterway was 9,400 and of sailing vessels

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13,700, making a total of 23,100, with a total tonnage of 2,470,000. For the same period ending in 1902 the corresponding figures were: Steamers, 12,500; sailers, 17,500; and 4,300,000 tons of freight for the total number of 30,000 vessels. Among the principal items comprised in this traffic was English coal consigned to Russian and German ports on the Baltic. Granite and limestone came from Sweden, and wrought iron and steel from Denmark, England, and Holland. Timber was exported from both Russia and Sweden, destined for the ports of France and of the Rhine. All descriptions of grain are sent from Russia to England and to Holland. Minerals from Sweden use the route to reach Germany and the Low Countries, and are also despatched from Spain for the Baltic trade.

Recently the original canal dues have been considerably altered. The general rate of 9d. per ton has been reduced, for sea-going vessels and ships over 400 tons burden, to 2½d. For coasting craft, and others employed for inland navigation, the charge has been reduced from 10s. to 6s. Ships in ballast are allowed a rebatement of 20 per cent. So far, there appears nothing to complain of, but now let us turn to the other side of the picture. In the year 1898, adhering to the same period already mentioned, the annual receipts amounted to £52,000. The corresponding expenses reached a total of £91,000, thus showing a deficit of £39,000. In 1902 the receipts rose to £87,000, but the expenses advanced, although not on a commensurate scale, to £99,000, leaving an annual balance on the wrong side of the ledger of £12,000. Summing up the total financial results of the last five years, the receipts reached the sum of £365,000, the expenses amounted to £458,000, and the deficit to £93,000. There are one or two features in connection with these statements which are deserving of notice, because, though adverse in the past, they do not promise unfavorably for the future ultimate success of the undertaking. In 1902 the annual receipts exceeded those of 1898 by £35,000, while for the same years the increase in the expenditure was limited to £8,000, while the deficit fell from £39,000 to £12,000. This satisfactory result was obtained although £11,000 were spent during the same year in enlarging and deepening the canal and prolonging the stations.

The continually recurring deficits are attributed to the heavy cost of maintenance, the low charge for vessels towed through the canal by tugboats, out of all proportion to the value of their freights, and to the free passage of ships belonging to the Imperial navy. As a set-off against these bare financial statements there are unquestionably both political as well as economical advantages accruing to Germany from the establishment of the Kiel canal. In comparison with the old route there is a saving of time, amounting to a whole day for steamers, and to three days for sailers, and the navigation is free from the dangers and shipwrecks besetting the narrow and stormy straits which characterize the sea-girt isles of Denmark. Should the progressive and decreasing discrepancy between receipts and expenditure continue as it has now done for some years past, it cannot be very long before at least an equality is established between them.

MERCHANT MARINE OF ITALY.

The total tonnage of the Italian merchant marine sank year by year from 1880 to 1895, but after the last named year a revival set in, and in 1901, the latest date for which statistics are available, it had regained the level at which it stood in 1880. In the meantime the amount of work it could perform was considerably increased owing to the greater development of the steam tonnage. The official statistics show that during the period named the sailing fleet sank from 7,832 ships and 922,146 register tons to 5,337 ships and 575,207 tons, while the steam fleet rose from 158 vessels and 77,050 register tons to 471 vessels and 424,711 tons—the steam fleet was therefore six times stronger, reckoned by the tonnage, in 1901 than it was in 1880. The following are the figures:

	Sailers.		Steamers.		Total.
	No.	Reg. tons.	No.	Reg. tons.	No.	Reg. tons.
1880.....	7,822	922,146	158	77,050	7,980	999,196
1885.....	7,111	828,819	225	124,600	7,336	953,419
1890.....	6,442	634,149	290	186,567	6,732	820,716
1895.....	6,166	555,569	345	220,508	6,511	776,077
1900.....	5,511	568,164	446	376,844	5,957	945,008
1901.....	5,337	575,207	471	424,711	5,808	999,918

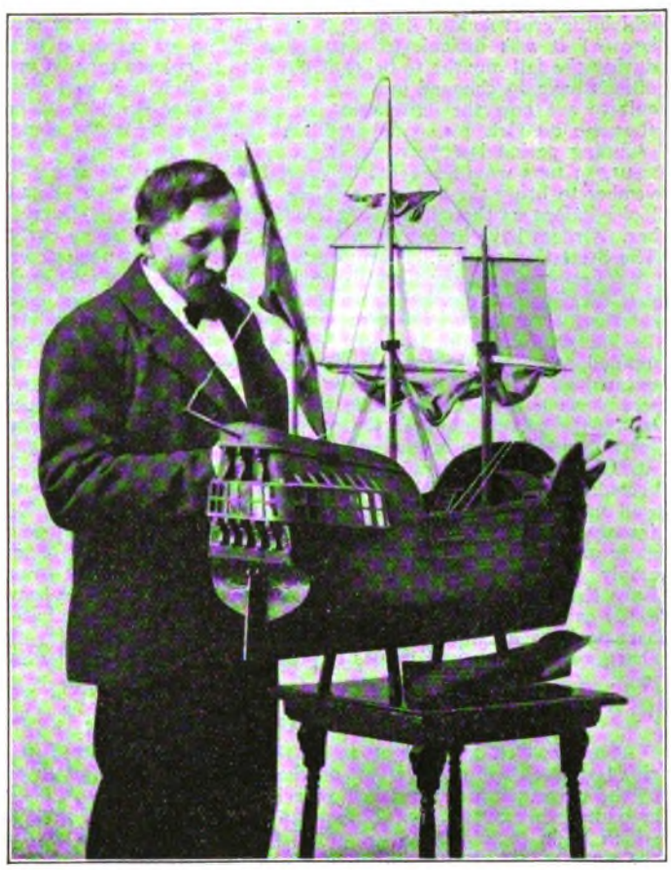
The sailing fleet existing on Dec. 31, 1901, consisted of 4,489 ships of 1 to 100 tons capacity, 473 of 101 to 500 tons, and 375 of above 500 tons; 141 of the number were built of either iron or steel and 5,196 of wood. The steam fleet existing on the same date included 115 vessels of 1 to 50 tons capacity, twenty-four of 51 to 100 tons, twenty-seven of 101 to 200 tons, thirty-five of 201 to 400 tons, twenty-two of 401 to 600 tons, thirty-five of 601 to 800 tons, seventeen of 801 to 1,000 tons, seventy-two of 1,001 to 1,500 tons, sixty-four of 1,501 to 2,000 tons, and sixty of a capacity superior to 2,000 tons net. In the year 1886 the Italian mercantile marine only included fifty-seven steamers of 1,000 tons net and upwards; in 1896 the number was 106, and in 1901 it was 196; this will serve to illustrate the progress made in steam navigation in Italy in recent years. As regards the age of these 471 steamers, 123 of them were not more than eleven years old at the end of 1901, and eighty-five of the number were of the most modern build. Among the vessels built in Italy on Italian account in the year 1901 are included twenty-five steamships of altogether 37,590 register tons net, and valued at 28.2 million lire, the principal ones being the Sardegna, the Liguria, the Lombardia and the Umbria, and to these may be added the Piemonte, the engines for which were, however, built in England—all these five boats were of 5,000 tons gross register and upwards. Three steamers were built abroad in the same year for Italian owners, and twenty-eight were procured from abroad by purchase. The bounties paid to Italian owners in 1901 out of the state funds were: Ship building bounties, 6,819,795 lire; reimbursement of import duty on ship building materials, 168,269 lire; navigation bounties 1,058,765 lire; total, 8,046,829 lire (£321,890) sterling.

MODEL OF THE MAYFLOWER.

Editor Marine Review: I am a maker of models, but it is very seldom that I take photographs of them. I am sending to you a picture of the ship Mayflower, and if it will be of any service to you you are welcome to it. At present I am making a model of a boat with a new patent wheel but it would not be proper for me, as a model maker, to give too much information about it. I am now engaged upon two models for the American Ship Building Co. of Cleveland that will, when finished, be especially fine.

OLUF JOHNSON.

Brooklyn, N. Y., Oct. 3.



Oluf Johnson and Mayflower Model.

Oluf Johnson is a sturdy Norwegian. He learned his trade as a ship builder in Norway, and, as foreman, has built many ships; but of recent years he has settled down as a model maker. His model of the Mayflower, herewith illustrated, was built for the Mayflower society. It is a complete model of the adventurous little craft that touched the shores of New England in 1620. Every rope, every spar, every block is in its place. The little vessel, moreover, is perfectly seaworthy. Latterly Mr. Johnson has made a model of the famous old British warship Sovereign of the Seas for Mr. J. Pierpont Morgan. The Sovereign of the Seas was of the vintage of 1637. Mr. Morgan was highly delighted with the work.

More than $7,000,000 is involved in a contract for armor plate which Secretary of the Navy Moody will award in a very short time. Three great industrial concerns, the Carnegie Steel Co., the Bethlehem Steel Co. and the Midvale Steel Co., are interested. The Midvale company submitted lower bids than the other firms which heretofore have had a monopoly in furnishing armor to the navy. Secretary Moody has virtually decided to divide the contract among the three companies. Ordinarily the Midvale company would have received the contract but it has never made armor plate and is under the necessity of constructing its plant first. The amount of armor plate required is 16,809 tons, needed for five battleships. The Carnegie and Bethlehem companies submitted identical bids at their regular prices and stipulated that the government should pay the Krupp royalty. The Midvale company agreed to pay this royalty itself.

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ORE MOVEMENT—LAKE FREIGHTS.

Looking at the iron ore situation from the reverse viewpoint, three weeks ago it was impossible to see how the movement could fall off sufficiently to bring the total down to 25,000,000 tons, which was the conservative estimate of the year's movement. The shipments up to Sept. 1 were only 668,000 tons below those of the corresponding period last year, and in the ease with which the great August movement was handled (the greatest ever known) it was difficult to perceive a slump of 2,500,000 tons during the fall months to bring it down to 25,000,000 tons. Conditions have so changed meanwhile, however, that it is now difficult to see how the movement can reach 25,000,000 tons. The shortage on Oct. 1 as compared with shipments for the corresponding period last year was 1,332,117 tons, which means that 2,801,753 tons would have to be moved during October and November to bring the season's total up to 25,000,000 tons. It now looks indeed as though very little ore will be moved in November. Orders have been pretty generally issued to close up early. The Steel Corporation has announced that it will give to its contract vessels all the ore that is coming to them by Nov. 1. Corrigan, McKinney & Co. have arranged to close the Stevenson mine on Nov. 1. Other of the great mines are to close on that date. Various of the smaller furnaces have written asking to have their unfilled orders carried over until next summer. Others have requested all deliveries to be made by Nov. 1, and from all quarters there is evidence of a desire to close ore deliveries by the end of the present month. Indications are, therefore, very strong for a decided slump in November, unless delay on account of the St. Clair canal accident proves more serious than is now expected. The season is likely to end both early and abruptly and well under the 25,000,000 mark as regards ore shipments. No reasons are given for the indisposition of the furnaces to take more ore and the conclusion is reached that they were more than amply supplied last year, and consequently have some left over. Lake Erie docks have been very quiet during the week and have easily cared for all they have had to do. The coal movement has become light but lumber tonnage is in good demand. Carrying charges on lumber will advance 25 cents all around on Tuesday next.

NORTHWESTERN GRAIN SITUATION.

Duluth, Oct. 15.—Wheat receipts at the head of Lake Superior last week were the largest on the crop, though behind those of the corresponding week last year by about 200,000 bu. They amounted to 2,292,168 bu. Shipments were 1,630,610 bu., besides which mills took 234,348 bu. Stocks showed an increased for the week of 454,210 bu. and is now in store 1,469,879 bu. Charters made ahead will take all this and much more, for the eastern milling demand is excellent just now and much wheat will be pushed down lakes to the close. Total receipts, all grains, for the week were 4,348,088 bu., almost a record figure, and total shipments were 3,098,048 bu. There are now in store at the head of the lakes 4,855,000 bu. of grain of all kinds.

Canadian freight vessels on the lakes, which have increased materially in numbers of late in anticipation of an immense grain business this fall and hereafter from Port Arthur and Fort William, have been severely hurt so far this fall by the competition of vessels of the Steel Corporation, which are being put into any freight channel that opens and which are making the rate from all upper lake ports. This is quite a disappointment to Canadian vessel owners, many of whom are now experiencing their first year of business on the lakes and all of whom have more ships than ever before. But more than in any previous year this wheat is going to Canadian outports and in this trade the Steel Corporation fleet is barred by customs limitations. The crop is moving very slowly in the Canadian northwest, so slow, indeed, that Montreal ocean tonnage, taken for some time past in anticipation of the requirements of Manitoba wheat for fall export, is now very soft, and the tonnage already chartered can scarcely be filled up before the close of lake navigation. The northwest Canadian crop is moving forward much later than was anticipated, owing to wet weather, etc., and the inspection at Winnipeg and elsewhere so far seldom runs above 200 carloads a day.

Steel steamers Henry G. Sill and Wisconsin, building at the works of the Superior Ship Building Co., are to be launched Saturday, Oct. 17 and Oct. 24, respectively. The Sill is 436 ft. long, 50 ft. beam and 28 ft. deep. The Wisconsin is 4 ft. longer. Both are for the ore and grain trades, the first for J. C. Gilchrist and the second for H. A. Hawgood of Cleveland. At the present time there is nothing in sight to indicate that the berths vacated by these two vessels will be wanted by any other.

The steel steamer Huronic of the Northwestern Transportation Co.'s fleet, will not appear at Duluth again this year, having been placed on the Sarnia-Port Arthur run while the Canadian wheat crop is being marketed. The Monarch is the only ship of this line to make Duluth this fall.

DULUTH FREIGHT SITUATION.

A Duluth vessel owner who is in very close touch with the freight situation at that point says:

"The 1¾-cent rate on wheat to Buffalo, made on Oct. 2 just after settlement of the strike of the Masters & Pilots' association, still prevails. Tramp vessels, meaning the ore and coal carriers, are offered for all October shipments at 1¾ cents. During the strike agents for tramp ships made large bookings at 2 cents, shippers being apprehensive that the marine difficulties would create a scarcity of tonnage in October. The Minneapolis flour mills strike was inaugurated simultaneously with the settlement of the Masters & Pilots' strike, and the railroad line steamers, deprived of flour supplies, were driven into the grain market for cargoes. They found the shippers were fully supplied with tonnage and cut the rate in order to stimulate shipments for their immediate needs. The Pittsburg Steamship Co. is in the market at the 1¾-cent rate and it possesses an immense advantage over the individual owner, because of its ability to supply steamers of any size for any period of loading. Receipts of grain are about 500 cars a day. This grain is being moved promptly, as the eastern demand for all cereals is excellent."

ELECTRICITY FOR ORE ROADS.

Duluth, Oct. 15.—All the leading mining and transportation officers of the United States Steel Corporation, accompanied by electrical engineers of the Westinghouse and General Electric companies, and of the Great Northern Power Co. of this city, have been on the Mesabi range this week examining the problem of iron ore transportation. Both electrical companies are making figures as to the cost of equipping and operating the two ore roads of the Steel Corporation, the Duluth & Iron Range and the Duluth, Mesabi & Northern, electrically throughout, and it is quite probable that something may come of the negotiations. It is proposed to secure power from the water of the Great Northern Power Co. to be used 1,800 H. P., alternating, single-phase locomotives of the type just installed at Baltimore, and discard steam locomotives between main line terminals. This will be if undertaken by far the greatest development ever made in transportation by electricity, as the two roads haul up to 2,000,000 tons a month for an average distance of 75 miles. The General Electric Co. has just made figures for converting the entire main ore line of the Great Northern road, from Mesabi range terminals to Duluth, from steam to electric, basing its bid on both electricity from a central steam turbine plant and from the water of the power company.

NEW STEAMER FOR GRAHAM & MORTON CO.

The Graham & Morton Transportation Co. of Chicago has just closed a contract with the Craig Ship Building Co. of Toledo for a side-wheel steamer to be 263 ft. over all, 65 ft. beam over guards and 16 ft. deep. She will have three tiers of staterooms with an inside balcony extending entirely around the interior. Her staterooms will number 125 in all, with sleeping accommodations for 500 persons. Her excursion capacity will be 3,500. The social hall and main deck will be finished in mahogany and the balcony in white and gold. The dining room and the crew's quarters will be made comfortable by apparatus for purifying and cooling the air. A distinctive feature of the new steamer will be that all her machinery and boilers will be practically in a steel well, rising from the keel to the top of the ship, in order to guard against fire. The engine will be of the triple-expansion, inclined type with cylinders 36, 52 and 72 in. diameter by 52 in. stroke of piston. Steam will be supplied by four Scotch boilers, 13 ft. in diameter and 12 ft. long, allowed a pressure of 150 lbs. and designed for 3,500 H. P. The new steamer is expected to make 20 miles an hour She will cost $300,000 complete. She is to be finished by June 1 next and will go on the Chicago-St. Joseph run in connection with the City of Chicago. The steamers Puritan and City of Milwaukee will go on the Holland run next season and the Argo will be sold.

The tug Peter D. Hershey, lying at the yard of the Empire Ship Building Co., Buffalo, was nearly destroyed by fire Monday. Three drill boats, belonging to the Buffalo Dredging Co., surrounded the burning craft and it was only by heroic work that the crew of the fire tug Hutchinson succeeded in keeping the flames from spreading.

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CHICAGO GRAIN REPORT.

Chicago, Oct. 15.—As will be noted in the summary of grain shipments, which is kindly furnished by P. H. Fleming & Co., vessel agents, the past week's grain movement exceeds the record of the preceding period by some 600,000 bu., whereas, if anything, the vessel offerings have ruled slightly in excess of this large business. Rates are thus unchanged but with a firm tendency at 1⅜ cents wheat, 1¼ cents corn and 1⅛ cents oats to Buffalo, Port Huron and Georgian Bay, with 2¾@3 cents to Kingston and with Montreal nominally 4½ cents.

The October government report is very favorable, suggesting in winter and spring wheat a total yield of 658,000,000 bu., (38,000,000 bu. over September estimate); in corn, 2,100,000,000 bu. (16,000,000 bu. excess of September); and in oats 787,000,000 bu. (66,000,000 bu. in excess of September).

Of the shipments noted below for the week just closed there was via all rail lines some 345,000 bu. wheat, 114,000 bu. corn, 846,000 bu. oats and 15,000 bu. rye; via lake to Buffalo and other American points 509,000 bu. wheat, 3,490,000 bu. corn and 238,000 bu. oats; via lake to Canadian points 25,000 bu. wheat and 443,000 bu. corn. The shipments, lake and rail, are as follows:

	This week.	Last week.	last year.
Wheat, bu.	893,604	747,840	328,729
Corn, bu.	4,049,122	3,664,655	1,659,410
Oats, bu.	1,084,805	994,969	950,775
Rye, bu.	15,155	10,890	35,300
Total, bu.	6,042,686	5,418,354	2,974,214

	Since Jan. 1, 1903.	Same time last year.
Wheat, bu.	16,518,313	25,647,660
Corn, bu.	71,880,104	34,566,534
Oats, bu.	51,094,351	43,759,523
Rye, bu.	3,040,763	2,020,831
Total, bu.	142,533,531	105,994,548

Stocks of grain in public and private elevators are thus reported:

	Week just closed.	Last week.	Same week last year.
Wheat, bu.	6,128,000	6,840,000	9,452,000
Corn, bu.	5,025,000	6,862,000	1,317,000
Oats, bu.	2,714,000	2,844,000	4,319,000
Rye, bu.	560,000	586,000	347,000
Total, bu.	14,427,000	17,132,000	15,435,000

DECISION AGAINST LAKE VESSEL OWNERS.

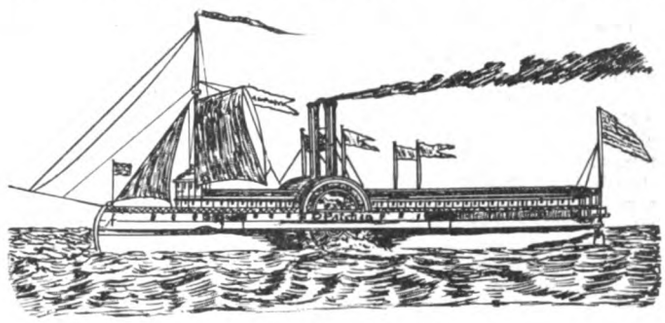
A quietus will probably be placed upon a number of cases for damages by the decision of United States District Judge Kohlsaat of Chicago in the Algeria case this week. In this case was involved the right of vessel owners to collect damages from the sanitary district by reason of the current in the Chicago river. Judge Kohlsaat decided against the vessel owners. At least a score of similar cases have been waiting for this decision, and claims amounting to hundreds of thousands of dollars would have been filed had Judge Kohlsaat decided in favor of the vessel owners. The "Algeria case" was typical of all the troubles which have occurred in the Chicago river since the opening of the drainage canal, by which the direction of the current was reversed and began to flow toward the Mississippi. Oct. 5, 1900, the barge Algeria suffered damages, detention and extra tug bills, to the amount of $800 in going from Halstead street to the mouth of the river, due to the current. There was no dispute as to the facts in the case, which was clearly cut throughout. The Corrigan Transportation Co., owner of the Algeria, sued the sanitary district for the loss on the grounds that the current in the river was greater than that allowed under the permit issued to the drainage district by the secretary of war. Judge Kohlsaat reviewed at considerable length the relations between the general government and the state of Illinois relative to the control of the Chicago river as a navigable stream and held that the rights of the government were not supreme as affecting the interests of navigation when opposed by the interests of sanitation for several million people. The vesselmen will appeal the case to the appellate court, and if the decision there is against them will take it to the United States supreme court. The questions involved are largely new, for never before has the current of an important waterway, like the Chicago river, been diverted and then increased to an extent dangerous to navigation at times.

LABOR LEADERS AGAINST GOVERNMENT DREDGES.

At a conference of labor leaders of the lakes held at the Hollenden hotel, Cleveland, last week, there were present the following: Capt. Charles McCarle, president of the Licensed Tugmen's Protective association; Archie Valequet, president of the Tug Firemen & Linemen's association; James O'Neill of the Dredge Firemen & Linemen's union; T. J. Dolan, Jr., of the Brotherhood of Steam Shovel and Dredgemen and President D. J. Keefe of the International Longshoremen, Marine & Transport Workers' association. The meeting was called for the purpose of taking some action towards having government work on the lakes pushed to completion. The labor representatives claim that the work is being delayed unnecessarily and that many members of their unions are thrown out of employment on that account. It was decided to take the matter up with Chief Engineer Gillespie of the war department, and Messrs. McCarle, Valiquet, O'Neill, Dolan and Keefe will go to Washington next month to discuss the matter with the chief engineer and other officials of the department. A resolution was adopted opposing the building of dredges on the lakes or at coast cities by the government. The labor representatives claim that if the work is done by the government 40 per cent. of the members of their organization would be thrown out of employment.

STRANGE OLD STEAMBOAT RULES.

Everybody is acquainted with the notices about care of valuables, bell-boy service, etc., that hang in the staterooms of steamboats. They are of a stereotyped kind, nearly all alike, nowadays, but such was evidently not the case in time gone by. Mr. Byron Whitaker of Detroit, well known among vessel men of the lakes, treasures an old copy of a notice of this kind that was used on



Steam Packet A. D. Patchin.

the Buffalo and Chicago steam packet A. D. Patchin, built in 1845 at what is now Trenton, Mich., by Mr. Whitaker's uncle, Harry Whitaker. A rough sketch of the so-called "Buffalo and Chicago steam packet" appears herewith, and the passenger regulations as set forth on the card are as follows:

1. In order to avoid difficulty and confusion during the voyage, passengers who have not paid their fare are desired to call at the office immediately after the boat leaves port, at the ringing of the bell.
2. No passenger will be allowed to occupy a berth with boots or shoes on, under penalty of $5.
3. Passengers are requested not to lie on the outside covering of the berth or bed, and will be expected to pay for any inordinary damages they may do the room or furniture.
4. No smoking allowed in any of the cabins or staterooms or on the promenade deck abaft the wheels.
5. Steerage passengers can have meals at the second ringing of the bell.
6. Steerage passengers are not allowed on the upper deck abaft the wheels.
7. Passengers are not permitted inside the pilot house except by invitation.
8. Gentlemen unaccompanied by ladies will not be permitted to take seats at the table until the ladies are seated.
9. Children will not be allowed at the first table.
10. It will be expected that parents will keep their children orderly and not allow them to injure the furniture or cabin.
11. Lounging in the cabin will not be allowed under any circumstances.
12. In order that we may know who are cabin passengers and detect imposters, the steward will call on all at the table to show their tickets. All unprovided with their passage tickets will be charged 50 cents.
13. Any impoliteness or neglect on the part of the waiters or cabin maids, to attend to the wants of the passengers, will meet a prompt rebuke, if made known at the office or to the steward.
14. No obscene language will be suffered on the part of the passengers or crew.
15. Passengers are particularly cautioned not to leave any articles exposed in their rooms, and to lock up their rooms when they leave them, in port.
16. Passengers will please remember to leave the keys of their rooms on board at the end of the voyage.
17. Passengers will not be allowed to carry the cabin stools on deck, nor remove any furniture out of its place.

Judge Swan in the United States court at Detroit this week adjudicated the Barry Transportation Co., which has operated the steamers Badger State and Empire State between Detroit and Cleveland this season, a bankrupt on the petition of three creditors. The Barry Transportation Co. through its attorney admitted the bankruptcy. Judge Swan referred the matter to Harlow P. Davock, referee in the bankruptcy, who will call a meeting for the purpose of appointing a trustee. The Barry Transportation Co. is a New Jersey corporation and is not connected with the Barry Bros. Transportation Co., an Illinois corporation operating boats out of Chicago.

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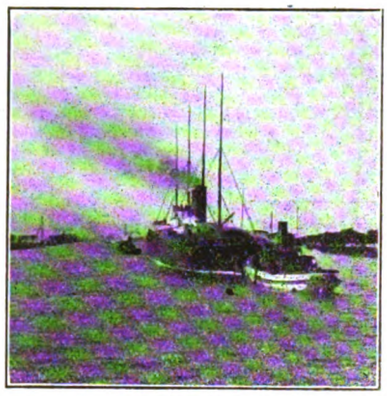
STEAMER GLIDDEN SUNK IN ST. CLAIR FLATS CANAL.



Freighter Passing Through Canal with Aid of Tugs.

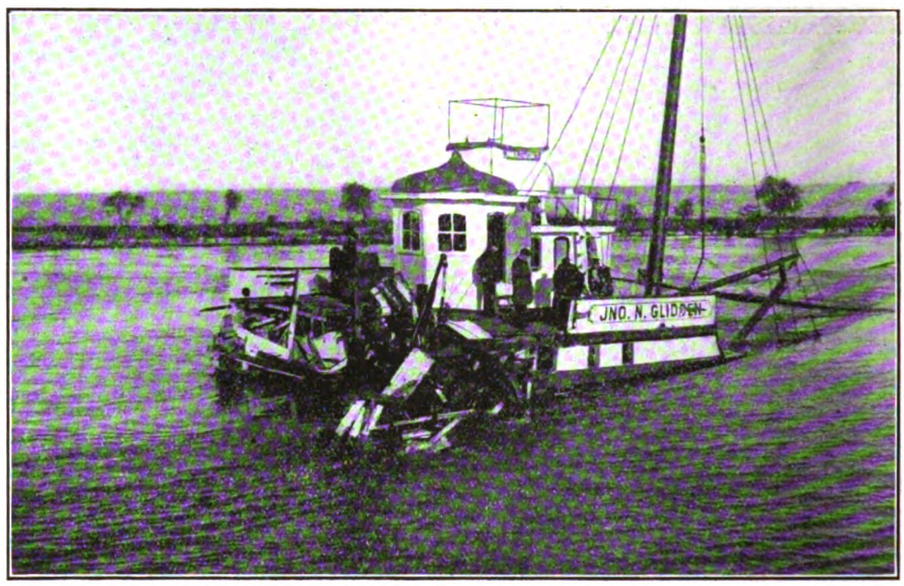
The wooden steamer John N. Glidden, a vessel belonging to the fleet of which William Gerlach of Cleveland is manager, collided in the St. Clair Flats ship-canal with the steel barge Magna, owned by the United States Steel Corporation, on Friday last and immediately sank. No more favorable spot to completely discommode navigation could have been selected, as all the commerce of the upper lakes passes through this slender neck of water. The Glidden with its cargo of iron ore sank diagonally across the channel, about 350 ft. from the lighthouse on the lower end of the piers. The stern of the sunken vessel, as is shown in the accompanying photos, is close to the west pier and the bow extends across to within 60 ft. of the east bank, almost completely blocking the channel. The facts as nearly as they can be gathered of the collision are these: The Magna was in tow of the steamer Empire City, bound up light. In order to avoid a pile driver doing repair work the Empire City swung well out into the channel. On account of the wind, which was blowing the barge over toward the bank, the Empire City was running fast to keep her tow from swinging around and missing the entrance to the canal. The steamer Glidden, bound down, was, according to a statement made to Maj. W. H. Bixby, government engineer, steering badly, and the suction from the Empire City is reported to have pulled the down-bound vessel over into the tow line. The next instant the steel bow of the Magna plowed into the Glidden, cutting the Glidden's bow cleanly like a knife as far back as the pilot house. The Glidden, with her cargo of iron ore, sank immediately in 20 ft. of water, the anchors of the Magna sticking to her when she went down.

The impact snapped the Magna's tow line and the barge drifted down the stream with the current. A dredge tug went to her aid, and after much maneuvering succeeded in towing her through the gap between the Glidden and the pier, and she then proceeded with the Empire City. To add to the general confusion, the steamer W. R. Stafford and the schooner Ed McWilliams were coming down through the canal about a tow length behind the Glidden, and, of course, were unable to stop. The Stafford crowded through the gap, through which the water was now racing furiously, and hit the drifting Magna. The tow line of the McWilliams broke, and, to add to the general excitement, the schooner began drifting down upon the Glidden. Further catastrophe was avoided, however, by the prompt interference of a tug which picked up the schooner.

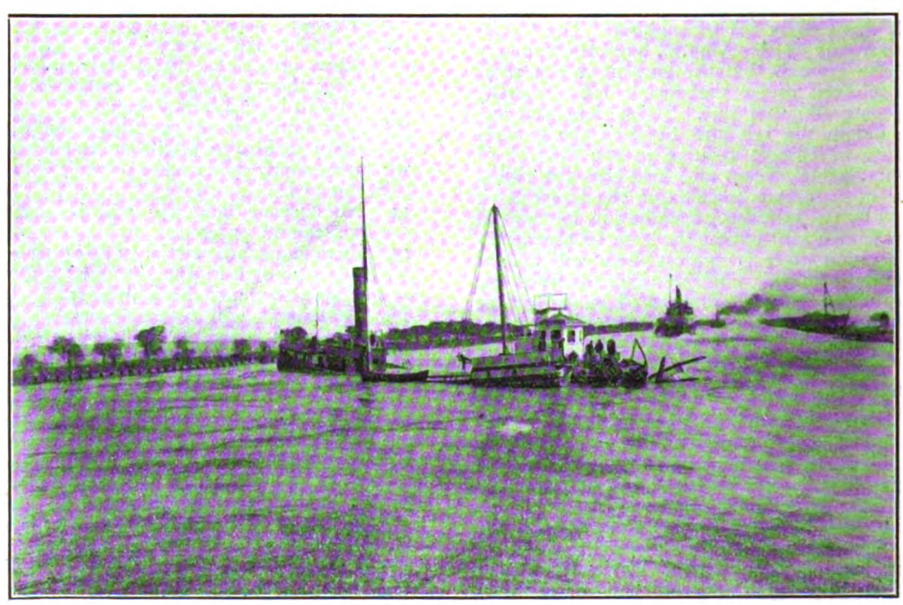
In order to lessen the interference with shipping, tugs were dispatched from Cleveland, Toledo, Amherstburg and Detroit, and the lighter Newman was sent from Port Huron. Maj. W. H. Bixby, government engineer, took steps to see that navigation was not entirely blocked, and dispatched the government steamer Hancock to the scene. Several vessels were taken through with the aid of tugs while daylight lasted. Maj. Bixby then issued orders that no boat should attempt to run the canal until daybreak. The tug Lorman was stationed in the lake below the canal and the Hancock in the river above the canal to stop all vessels. In the morning the surrounding waters presented a congested scene of shipping.

Capt. William Gerlach, the owner of the Glidden, after visiting her with his attorney, abandoned the vessel to the underwriters. Capt. Cyrus Sinclair, general manager of the Great Lakes Towing Co., made a thorough inspection of the sunken steamer and refused to make a bid on removing the wreck except by lightering the ore cargo with the wrecker Newman and endeavoring to pull her out of the way of passing vessels. Maj. Bixby had ordered no up-bound vessel to pass her without the aid of a tug, and no down-bound vessel without the aid of two tugs, yet notwithstanding these precautions seven vessels hit the wreck in passing on Saturday and each one left her in a little worse condition than before. The steamer Oceanica was the first to strike the sunken Glidden. She became unmanageable in the strong current and the tug that had her in tow could not handle her. The Oceanica took a sheer and cut an additional 5 ft. off the bow of the Glidden and carried away considerable of the wreck below the water line. The steamer George Presley also took a sheer into the wreck, crushed some planks and timbers and warped the boat out of shape. Whaleback barge No. 134 hit the wreck directly in the hole made by the Magna and almost split her open. The steamers Major and Beatty were next to strike the wreck, driven over by the current which the tugs were unable to counteract, and finally the J. H. Wade broke away from the tug Watson while going at full speed and hit the Glidden just aft of the pilot house, carried away her bulwarks and light upper works, knocked the pilot house over to an angle of 45 degrees, and then took a lead over towards the west bank of the canal, smashing the side planking of the wreck and opening up her seams for almost her entire length.

Capt. Harris W. Baker, wrecking master, thought somewhat of raising the sunk-



Bow View of the Glidden.



The Glidden as She Lies in the Channel, Looking up Canal.

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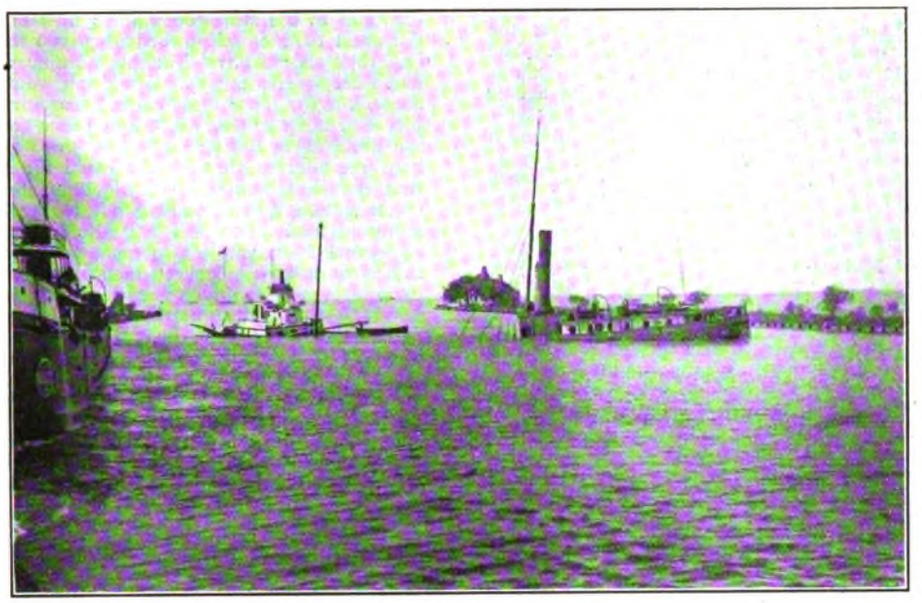
en steamer for the underwriters, but the general opinion was that he would be unable to do this. He sent down divers, but was compelled to cause them to desist, owing to the fact that passing vessels were repeatedly striking the wreck and putting their lives in jeopardy. He finally declared that he would not permit them to work unless the vessels were required to stop, but Maj. Bixby decided that navigation could not be stopped. It was thereupon resolved at a conference between the government engineer, Managing Owner Gerlach and the underwriters to blow up the steamer with dynamite. This to be done without stopping traffic in the canal.



View showing Glidden across the Canal with Freighter Passing to the Left.

Capt. W. H. Baker, wrecking master, accordingly began on Tuesday night of this week the task of blowing up the Glidden piecemeal. The work will be prosecuted only at night and only small quantities of dynamite will be used at a time. Beginning at the bow the timbers and sides will be blown out bit by bit. It is the intention to cofferdam the stern in order to later raise and save the machinery. It is estimated that two weeks will be required to remove the wreck entirely. Meanwhile navigation will not be suspended, but the passage of vessels through the canal will be greatly retarded.

The Glidden was built at Cleveland in 1879. She was 221 ft. keel, 35 ft. beam and 19 ft. deep. She was insured in companies represented by Smith, Davis & Co. of Buffalo. Her cargo of ore, which was shipped by M. A. Hanna & Co., was also insured.

EXAMINATION FOR STEAMBOAT INSPECTION SERVICE.

The United States Civil Service Commission announces an examination on Nov. 18-19, to secure eligibles to fill a vacancy in the position of inspector of boilers of steam vessels for the district of Nashville, Tenn., at $1,200 per annum, and other similar vacancies as they may occur. There are nearly 200 places throughout the country where this examination may be taken. The necessary papers may be had by applying to the United States Civil Service Commission, Washington, D. C., or to the secretaries of local boards of civil service examiners, who hold government positions, mostly in the customs service. Two days of eight hours each will be taken up in this particular examination. The age limit is twenty-five to fifty-five years. The points in the examination and their weight are: Letter writing, 10; arithmetic, 10; boilers and machinery, 60; experience, 20.

An applicant for the position of local inspector of boilers must have had at least five years' actual practical experience as chief engineer of ocean or inland steamers of over 100 gross tons, as first assistant engineer of inland steamers of 600 gross tons or over, or as first assistant engineer of ocean steamers of 1,500 gross tons or over, a portion of which experience must have been within the five years next preceding the date of application. The experience required must have been under United States license, and the fact that he has been so licensed must be of record in the treasury department. An applicant for the position of assistant inspector of boilers must have the same qualifications as for local inspector, except that the term of service required under license must be three years, a portion of which service must have been within the five years next preceding the date of application.

Any applicant interested, either directly or indirectly, in any patented article required to be used on any steamer of the United States, or who is a member of any association of owners, masters, engineers, or pilots of steamboats, or who is directly or indirectly pecuniarily interested in any steam vessel, will not be required to surrender his interest in any such steam vessel or article used thereon, or to resign his membership in any association of owners, masters, engineers, or pilots of steam vessels previous to taking the examination, and will be required to surrender such interest or to resign his membership in any association of owners, masters, engineers, or pilots only in the event of his receiving and accepting appointment as inspector of hulls or boilers. Preference will be given to eligibles who are legal residents of the districts in which the vacancies exist. The examination is open to all citizens of the United States who comply with the requirements. Competitors will be rated without regard to any consideration other than the qualifications shown in their examination papers, and eligibles will be certified strictly in accordance with the civil service law and rules. Persons who desire to compete should at once apply for the necessary papers which should be properly executed and filed with the commission at Washington prior to the hour of closing business on Nov. 9, 1903. After that time no application will be accepted for this examination. In applying for this examination the exact title "local and assistant inspector of boilers" should be used in the application. No request will be granted for examination on any other date or at any other place than those given. The list of places where examinations will be held includes almost every city in the country that has a custom house.

REORGANIZING THE CONSOLIDATED LAKE SUPERIOR.

Details of the reorganization plan for the Consolidated Lake Superior Co. by the Philadelphia stockholders' committee, dependent upon the completion of some arrangement with the Speyer syndicate whereby the sale of the properties may be obviated, were made public in Philadelphia last Saturday. The plan will place the company under the new name of the Lake Superior Corporation and provides for an issue of $40,000,000 new stock and an issue of $10,000,000 bonds, of which $2,857,000 will be retained in the treasury. The stock division is to be as follows: Fourteen million dollars exchangeable for $28,000,000 preferred of the present company with a $3 assessment; $18,000,000 exchangeable for $72,000,000 common of the present company with a $3 assessment; $5,857,000 to go as a bonus to the underwriting syndicate. It is proposed that the underwriting syndicate, in which stockholders are invited to participate, is to pay $3,000,000 for stock in the new company and $5,000,000 for $7,143,000 at 70. After the underwriting is completed the bonds will be offered to the stockholders on the same terms. This financial reconstruction is dependent upon the indefinite postponement of the proposed sale to satisfy the claim of the syndicate headed by Speyer & Co., or upon some arrangement whereby the sale may be abandoned through an extension of the so-called Speyer loan until such time as it may be taken up by the reorganized company. While it is not clear as yet how this loan is to be quieted the stockholders do not despair of satisfying it.

MEAN STAGES OF WATER.

Gage records of the United States lake survey show the following mean stages of water above mean sea level, for September, 1903:

	Stages during Sept. ft.	Higher than during same month last year. ft.	Higher than during Sept. 1895. ft.
Lake Superior	602.72	0.35	0.19
Lake Michigan	580.33	0.29	1.04
Lake Huron	580.28	0.21	0.78
Lake Erie	572.68	0.21	1.31

Present fall Lake Huron to Lake Erie, same as year ago.

Naval Architect W. J. Wood has returned to Chicago from Michigan City, where the plans for a new boat were approved by the stockholders of the Indiana Transportation Co. The plans will be submitted to the various shipbuilding companies for bids. Four companies are eligible to construct the style of boat desired. These are the American Ship Building Co., the Jenks yard at Port Huron, the new Great Lakes Co. at Detroit and the Craig yards at Toledo. The company expects to get delivery of the new boat by April 2.

The large steel freight steamer building at the works of the Jenks Ship Building Co., Port Huron, for the Mack estate of Cleveland will be launched Oct. 17 and will be named F. R. Squire. This steamer is 430 ft. keel, 40 ft. beam and 28 ft. deep. She will carry 6,000 tons of cargo.

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WARM CANAL CAMPAIGN IN NEW YORK STATE.

Buffalo, Oct. 14.—As election day, Nov. 3, approaches the campaign on behalf of canal improvement grows warmer. The people are to decide as to whether the state will or will not improve the Erie canal and other of the state waterways at a cost of $101,000,000. As the proposition looks now, it will receive more favorable votes than unfavorable ones, but the different commercial bodies throughout New York state which are interested in canal improvement are not taking any chances. They are working harder than at any time since the campaign was opened.

The opposition, where it has been encountered, is chiefly in the rural districts. The people in the rural sections are carrying on a campaign as aggressive and extensive as that which is being conducted by the different commercial bodies. The daily and weekly rural papers are being inundated with plate matter and circulars sent to them by the anti-canal men, and some of these journals give as much as three or four columns an issue to arguments against enlarging the canals. The sentiment in Greater New York, Buffalo and some of the other large cities is in favor of canal improvement, but Rochester seems to be opposing it. Vesselmen and canal men and those commercial interests which would benefit from an enlarged canal are confident that the anti-canal forces will be badly beaten at the coming election.

If the majority of the votes cast for the canal-enlargement proposition is favorable to it, the preliminary work will begin at once. The first step will be the issuance of $101,000,000 in bonds by the comptroller of the state. Of that sum he is not to sell more than $10,000,000 during 1904 and 1905, the proceeds to be spent on the engineering and preparatory work. The actual work on the improvement is not likely to be started until 1906.

The canals are to be made 12 ft. deep and 75 ft. wide at the bottom, with a water-cross section of 1,128 sq. ft., except at aqueducts and through cities and villages, where that width may be reduced. In rivers and lakes depths of the canals are to be 12 ft. and the bottom width 200 ft. All the locks are to be single, except at the flight of three locks near Waterford and two locks at Lockport, which are to be double. Routes of the improved canals follow:

Erie—Beginning at Congress street in Troy, N. Y., up the Hudson river to Waterford, west through the branch north of People's island and by a new canal and locks to the Mohawk river above Cohoes falls, along the Mohawk river canalized to Little falls, thence generally by the existing line of the Erie through Little falls to Mohawk above the upper dam, along the Mohawk canalized to a point east of Jacksonburg, the line of the Erie canal to Herkimer, valley of the Mohawk to a point six miles east of Rome, over to and down the valley of Wood creek to Oneida lake, through the lake to Oneida river, down the Oneida river to Three River point, up the Seneca river to outlet of Onondaga lake, still up the Seneca to and through the state ditch at Jack's reefs, west along the Seneca to Crusoe creek, then paralleling the New York Central Railroad to a junction with the Erie about 1¼ miles east of Clyde, practically along the present Erie canal to Fairport and Pittsford, running across the country south of Rochester to the Genesee river, thence to junction with the Erie canal about one mile east of South Greece, along the Erie canal to Tonawanda, thence by Niagara river and Black Rock harbor to Buffalo and Lake Erie. The existing Erie canal from Tonawanda to Main street, Buffalo, is to be retained as a feeder and harbor.

Oswego—At the junction of Oswego, Seneca and Oneida rivers, northward to Lake Ontario at Oswego, following the Oswego river canalized and present Oswego canal.

Champlain—Beginning in the Hudson river at Waterford, up the Hudson canalized to near Fort Edward, thence by the present route of the Champlain canal to Lake Champlain near Whitehall.

The state engineer may take possession of lands, structures and waters, the appropriation of which he may deem necessary. The court of appeals is to determine the amount of compensation for such property and waterways. The state is authorized to sell abandoned canal property and apply the proceeds to the care of the improvement. All work is to be done by contract. The governor may employ, at a compensation to be fixed by him, five expert engineers to act as an advisory board of consulting engineers. The state engineer is authorized to appoint a special deputy and additional resident engineers.

LEWIS NIXON ON AN ENLARGED CANAL.

Mr. Lewis Nixon in commenting upon the proposed enlargement of the Erie canal gives a number of decided reasons why a ship-canal is not feasible as a means of solving the New York state water transportation problem and also gives in detail reasons in support of his contention that the 1,000-ton barge is the medium through which the problem must be solved.

"Every one that has investigated the subject of a deep-water canal," said Mr. Nixon, "has pronounced against it, but in view of the fact that such a canal has been taken with a certain amount of seriousness by those who oppose a 1,000-ton barge canal, I am very willing to give you my opinion of its practicability from a boat builder's point of view. You may take it as an axiom of waterborne commerce that the carrying of freight varies about inversely as the depth of the water you are able to employ—that is, applied to deep water; hence we find the greater the cargoes that are carried the deeper the draught of the vessels, and in the stupendous ships now on the ocean which carry the great cargoes of upward of 30,000 tons we find it necessary that they should have draughts of upward of 30 ft. Now if we had a deep-water canal we would not want it for the light-draught boats, but for those most efficient for carrying freight, if our object was not to break bulk, and hence for a deep-water canal to the great lakes the idea of great ships going 12 or 14 knots an hour meandering through the canal for 400 or 500 miles is one that the ship builder would contemplate with derision and not seriousness. When the boat got to the lakes it would be absolutely useless. You will find the scheme of the United States government contemplates a general channel of about 20 ft., but the harbors have only been made for about 16 ft. draught, so no deep-sea vessel could be used when it got to the lakes.

"Of course the question of building a great canal, capable of taking a deep-water boat, is one for engineers, but I expect the first thing that would probably turn out would be the fact that they would not have water enough if they attempted to do it. I do not believe it would be possible to use the same boat on the lakes that we use at sea. It is a question, of course, of construction and operation. If we attempted to run a steamer at the very low speed of 4 or 5 miles an hour through the canal, when her economical speed was fourteen at sea, you can see the loss of power and expenditure of energy of machinery there. There would be a stupendous loss in the burning of coal, keeping a large crew, and all the factors that go to make up an increased cost; so we would have a very much larger charge than on any vessel suited to the canal navigation.

"I believe that in the 1,000-ton barge you have hit upon the most economical vessel for handling freight. We must not consider grain alone, but if we are to consider our future advancement we must consider the mines and raw material which we have not in our own state, and being a manufacturing state, we must have the means of bringing and laying down the raw material at the cheapest possible price, and the only thing that will do it is water transportation. The carrying out of this canal plan would keep New York from dropping into the present condition of New England.

"A striking argument for what we are interested in is that even on the ocean, where steamers can be used to the greatest efficiency, we find that the barge traffic along our coast is assuming tremendous proportions. In other words, one crew will pull enormous loads by means of barges, very much as we would on the canal. A 1,000-ton barge is a barge which is large enough to pass from the lakes through the canal and down through Long Island sound, and even through the Raritan canal into Chesapeake bay, so New York would probably become a distributing point for all sorts of freight that could be carried, and where time is not a great element, probably from Virginia to Maine. I have had some experience with the building of barges, and I am satisfied that we have not cut too low in the 1,000-ton barge canal. I believe the 1,000-ton barge will be found absolutely efficient in every possible way for the handling of freight, and its availability, from the point of view of the smaller community, will be found much more useful than a great barge handling many thousands of tons in loading and handling around our harbor and reloading back. Regarding the cost of this improvement, it is rather significant that two of the railroads coming to this city are spending the entire cost of this canal on terminals alone here in the city of New York. It would seem that an expenditure of what two railroads can afford to expend on their passenger facilities in the city of New York would not be exorbitant for the entire state.

"I believe, too, in the carrying of freight there are certain forms of freight or types of freight that must be carried almost at a loss by the railroads, in order that they may bring the raw material to be provided in the forming of the finished product which must be carried away at a higher rate. And as we interchange the commodities, I don't think the railroad lines of this country are going to be adequate to handle not only the raw material but passengers and quick freight. You know some of the fast trains were taken off last year simply because the freight was practically congested. You know perfectly well we have had a freight famine almost every year in this country, and we need this relief from the higher grade of freight to the railroads themselves. Naturally, of course, we must assume that they know their business better than we do. And still it must impress itself upon us that they may find some other reason why they should control this raw material. But with the freer, cheaper raw material along the various cities spoken of from here to Buffalo we shall see new factories of every nature spring up that can and will be of benefit to that particular locality, and reaching back into the various parts of the state and benefiting every citizen of the state."

Mr. Nixon's argument is excellent and is not at all vitiated by minor discrepancies of information. The leading harbors of the lakes are 20 ft. in depth and some will soon be deepened to 25 ft.

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AROUND THE GREAT LAKES.

The steamer Eastern States has been withdrawn for the season from the Detroit-Buffalo run.

First Lieut. Lewis H. Rand has been ordered to Cleveland as assistant to Maj. Dan. C. Kingman, government engineer.

The passenger steamer State of New York made her last trip to Toledo last Thursday. She has gone into winter quarters at Detroit.

There is now 30 ft. of water over the wreck of the steamer C. B. Lockwood off Fairport. The late storm washed the masts of the steamer away. Nevertheless it is still marked with a buoy.

Nels Anderson, master of the tug Thomas Thompson, has begun, under a contract with the government, the work of laying the new cable from the mainland of Door county to Death's-door entrance to Green Bay.

Another of the ten modern freighters being built for J. C. Gilchrist of Cleveland by the American Ship Building Co., at West Bay City this week was named F. W. Gilchrist. She is 436 ft. long, 50 ft. beam and 28 ft. deep.

In a collision between the Barry Line steamer City of Fremont and the schooner J. J. Newland at Racine last week both vessels were severely damaged. The schooner's boom crashed through the upper works of the steamer.

A large sand bar, formed by the autumn gales and lying 1⅞ miles due east of the South Chicago harbor piers, has been named the Rockefeller shoal. Lieut. W. J. Nelson, in charge of the branch hydrographic office, Chicago, directs attention to this obstruction.

In launching the steamer J. C. Gilchrist at Lorain Saturday last the American Ship Building Co. broke its record for despatch at that yard. It was just eight weeks and two days from the time the keel was laid until the Gilchrist was launched. The new vessel is a duplicate of several already launched and is 436 ft. over all, 50 ft. beam and 28 ft. deep.

One of the Richelieu & Ontario Navigation Co.'s steamers, the Carolina, which has been aground at Passe a Pierre, 6 miles from Tadousac on the Saguenay river, since Aug. 19, was successfully floated last week. The extent of the damage is not yet known. All machinery and movable fittings were taken out of the steamer before she could be floated.

While trying to make a landing at the government breakwater at Cape Vincent and escape the fury of Friday's terrific gale on Lake Ontario, the steamer Hecla figured in a novel accident. When almost in reach of shelter the steamer was picked up by a monster wave and carried to the top of the submerged crib extension. She was taken off by tugs and towed to Kingston.

In progress through life one is constantly perplexed by the amazing difference which exists between tweedledum and tweedledee. In length and breadth, in height and width, to the sight and to the weight they are precisely alike. They smell the same and are as twinlike as two peas in a pod, but nevertheless they are as different as night is from day. Tweedledum is a sinner and Tweedledee is a saint. Now what is the difference between Capt. Frank Rae as master of the steamer Clemson and Capt. Rae as assistant superintendent of the Pittsburg Steamship Co., and what is the difference between Capt. Chambers as assistant superintendent of the Pittsburg Steamship Co. and Capt. Chambers as master of the steamer Clemson? Probably the members of the Masters & Pilots' association will tell you there is all the difference in the world. Neither one is a member of the union and there is absolutely no difference in their reversed positions; but for all that one is tweedledum and the other is tweedledee.

MR. BURTON ON WATERWAYS' IMPROVEMENTS.

Congressman T. E. Burton, who has just returned from an extended inspection of the waterways of Europe, has given his general observations to the public. In Washington a few days after his arrival he gave out a statement concerning the methods of levying the taxes for waterways improvements abroad, but he has not signified as yet what recommendations he may have to make upon this score. His statement reads:

"There are rumors of an effort to prevent the passage of a river and harbor bill at the next session of congress. I do not know what strength the movement has gained. On the other hand there has never been a time when the pressure for river and harbor appropriations was so great. Almost every paper I have examined since my return contains an article in advocacy of some expensive project. The pressure proceeds from all parts of the country and is alike noticeable for rivers and harbors. It is evident that the customary appropriations for past years, $20,000,000 to $25,000,000 a year, will not meet the increasing demands. Congress should establish a logical, consistent policy and adhere to it. Several methods might be pursued. One would be for the general government to engage in the improvement of rivers, canals and harbors on a very large scale in a manner similar to that pursued by France in recent years. This would necessitate multiplying appropriations to at least three or four times the customary amounts. Another, and the opposite way, would be to limit appropriations to even smaller sums than at present, selecting only such improvements as will afford a prompt return and assure a greatly increased traffic. A third way would be to divide the expenses between the general government and the localities specially benefited. This last method has many advocates, but it is by no means free from difficulty. And as expression of my views, I can hardly add to some remarks made in the house of representatives in April, 1896:

"'Plausible arguments have been made for the adoption of a system under which a fraction of the expenses of our river and harbor improvements should be paid by local authorities or collected from the localities regarded as especially benefited and the balance paid by the general government. It is maintained by the advocates of this plan that such a division would secure a more equitable adjustment of the burden of expense and assure good faith and the exercise of the best judgment in the adoption of projects for improvement. The objections are that all these projects have come to be regarded as distinctively national in their character and not to be undertaken unless proper subjects of expenditure from the national treasury. That the necessity of including different localities or states in a single improvement would require a concert of action by numerous and perhaps varying interests almost impossible to obtain; and further that less deserving projects would be presented with offers to furnish the portion to be paid by local taxation and they would obtain recognition to the exclusion of more important projects for which less pecuniary support could be furnished.'

"It must be said, however, that the present situation increases the strength of the argument for imposing upon specific localities part of the expense unless the sentiment of the country will cordially sustain a very large increase in federal appropriations. The present pressing demand for increased river and harbor facilities arises from a multitude of causes. Among them may be mentioned the great growth of the country, the increase in articles carried and the greater distance they are carried. This increase is out of proportion to the increase of their value, for it must be noted that while our population is increasing, the wealth of the country is increasing in larger proportion and transportation in much larger proportion still, because the bulk of the articles consumed is increasing as well as the distance they are carried. Frequent congestion on railroads have occurred in recent years because they have been unable to promptly carry the freight offered them. Another cause for the present demand arises from the use of deeper draught boats in ocean and lake trade, which necessitates the deepening of channels in other harbors. In France under a change of policy this year (1903) the local communities are expected to contribute a portion of the expense for improving certain harbors and waterways by which they are directly benefited. They are receiving the right to impose tolls for reimbursement. In some of these new projects the waterway tolls which were abolished in 1880 are renewed."

CHAMBERLAIN'S CRUSADE FOR PROTECTION.

The great weakness of Mr. Chamberlain's position in his present crusade for preferential tariffs is that it is purely gratuitous. There has been no demand for preferential tariffs. Nor is England likely to change that fiscal policy which has made her the greatest of buyers in order that she may become the greatest of sellers. What does England want with protection? Her home market is not her chief market. The position of the United States and England are as opposite as the poles. The chief market of the United States is the home market which is the most extensive in the world. The United States has coal and ore in untold abundance and England has it in limited quantities. It would be folly for England to put up a protective barrier against the very things which she needs to maintain her position as an exporting nation. Nor has she anything to fear in the so-called "dumping" policy of other nations—that is a disposition to dump the surplus at cost or less than cost in England. That is a policy which the buyer can stand longer than the seller and a moment's consideration will convince anyone of that fact. British manufacturers will undoubtedly take all the raw steel that they can get at cost figures. They couldn't do any better than that if they made it themselves; and they couldn't do as well if they procured it at less than cost. There is no tariff scheme for bargaining with other nations that will not hurt England more than it will hurt the other nations—and no one knows that more clearly than the British themselves. If England were a country vast in native resources, self sustaining in every way with a capacious home market, it would be to her advantage to keep it to herself. But she is not vast; she is not self sustaining; her native resources are not ample. Cut her off from the rest of the world and she would starve; she is a manufacturing nation simply; her market is beyond the seas and her life is in her ships. Protection would be a sad blow to British shipping, for it would curtail the return cargoes which are sources of steady profit.

CANADIAN SHIPPING NOTES.

The Richelieu & Ontario Navigation Co. made $100,000 more this season than in 1902.

The Dominion government will spend $75,000 putting two faster cruisers on the great lakes than the Petrel and the Active. They are likely to be in commission next year.

The Canadian government has placed over $400,000 in the estimates to be spent on harbors and improvements to shoals and lights in the St. Lawrence, and at the foot of the great lakes.

Capt. Archibald McMaugh, St. Catherines, is suing the Hamilton & Fort William Navigation Co. for damages for wrongful dismissal. The trial, set down for Oct. 26, has been further adjourned until the spring, as many of the witnesses wanted are still away sailing the lakes.

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ENTOMBED IN A CAPSIZED SHIP.

Possibly no apologies are necessary for publishing in a paper devoted to the industrial and commercial side of shipping the following remarkable story of a ship master entombed in a capsized ship. It will certainly be of great interest to all ship masters, for perilous as have been the positions of many of them at various times in their career, there is doubtless not one who has had to undergo an experience of such complicated horror. The story is reprinted from the World Wide Magazine and is related by Mr. Frank S. N. Dunsby of the Seamen's Institute, Neufahrwasser, Germany. Mr. Dunsby relates the strange adventure as follows:

Capt. Hans Engellandt is a young married man of 31, with two children. He is skipper and owner of the Erndte, a new steel "galliot," or sloop, of some eighty odd tons. The Erndte left Memel on April 16 last with a cargo of timber for Bremen. Capt. Engellandt was in command, and his crew consisted of a mate—his brother-in-law—and two men. It was blowing hard when the voyage began, but nevertheless the captain held on, hoping to make a quick passage, the wind being favorable. About midday, however, the weather changed for the worse. The wind steadily increased and icy showers of rain and snow fell frequently. Deeply laden as she was, and carrying a heavy deck load, some 3 or 4 ft. high, the galliot labored badly in the rising sea, and accordingly sail had to be shortened. By 7 o'clock in the evening a full gale was blowing, with a heavy sea; but the vessel, being now under a treble-reefed mainsail, did not ship any water. By midnight, however, the gale had become a veritable hurricane, and the little galliot drove ahead swiftly before the roaring wind and following sea. This state of affairs continued until 5 a. m. on the morning of the 19th, when the ship had covered, according to the log, 120 miles. During the whole of this time Capt. Engellandt had been at the wheel, steering his vessel through the storm and encouraging his little crew. Needless to say, he was wet through and thoroughly exhausted with his long vigil, and as there did not seem to be any immediate cause for anxiety he gladly relinquished the wheel to the mate while he went down to his cabin to put on some dry clothes and get a much-needed rest. He had only just completed the change—the operation being rendered somewhat difficult by the rolling and pitching of the galliot—when the vessel gave a tremendous lurch and threw him off his feet, hurling him with considerable violence into a corner. On picking himself up Capt. Engellandt looked around in absolute bewilderment. What on earth had happened? And what was amiss with the trim little cabin? Then like a flash he realized that he was standing on the roof of the cabin and that the floor was above his head. With the recognition of this strange state of affairs came the knowledge of its cause. The ship had capsized—turned turtle—and was now floating keel upwards. And he was caged—caught underneath the ship like a rat in a trap. If further confirmation of this terrible fact were needed it was furnished by the bilge-water from the vessel's hold—now above the prisoner's head—which ran down the sides of the cabin towards what had been the roof. This was now being rapidly covered by water which rose from below. As to what had become of his crew, Engellandt could only surmise that they must have been swept overboard and drowned when the furious squall turned his vessel over. Most men would have given way to utter despair upon finding themselves in such an awful position. Not so Capt. Engellandt. The first thing he did was to climb up as far as possible towards the vessel's keel, out of the way of the water, which now covered the cabin floor to a depth of several feet. It got no deeper, however, and he came to the conclusion that the cargo of wood, taken in conjunction with the quantity of air imprisoned in the hull, would serve to keep the ship afloat—for some time, at least. He also ascertained that the water rose higher up the ship's side outside than in the cabin. All this time the capsized ship was rolling in the heavy seas, and the water below the captain was washing about the cabin, carrying away everything movable. If he once fell into that Engellandt knew that he would soon be drowned or dashed to pieces against the ship's side, so he set about making a perch for himself as near the ship's keel as possible. A moment's thought showed him that, as his ship was 11 ft. deep and the cabin about 7 ft. high, he had 4 ft. between him and the keel. By dint of a little work he was able to pull away some of the planking forming the floor of the cabin, and climb through into the narrow space between it and the ship's plates. Here—at all events for the present—he would be fairly safe from the water below. His next thought was concerning food. Was there any in the cabin, or were hunger and ultimate starvation to be added to the horrors of his plight? With feverish anxiety he searched about. The result was the discovery of about 3 lbs. of raisins, 3 lbs. of rice, a similar quantity of sugar—and a sausage. This little stock the prisoner at once conveyed to a place of safety, dividing it into portions and placing himself upon rations, for how long he might remain cooped up in that iron hull before rescue came or death claimed him he did not know. The food question being settled, it remained to devise some means by which he could make his plight known to passing ships. Here he was badly handicapped. A man alone on the deck of a derelict ship, even if she be dismasted, can usually find some elevated point, if only his outstretched arms, from which he can suspend a signal, while his voice assists him to communicate with possible rescuers. But poor Engellandt's position was infinitely worse. He was inside the wreck—buried alive in the darksome vault formed by the ship's upturned hull—and his voice was effectually stifled in that confined space by the continual wash of the waters around and below him. Finally he managed to find a wooden mallet, and with this he struck heavily on the ship's iron plates. They gave forth a sharp metallic sound, which he hoped would be audible to some passing ship, but in his heart of hearts he was well aware the sound would not penetrate far. Prudent mariners, moreover, usually give capsized derelicts a wide berth—there is no good to be got from them, and much possible harm. And what sailor in his senses would dream that under that wallowing hulk, over which the seas broke continually, there was a human living being? Although he found a lamp and some matches, the prisoner did not light it. He knew perfectly well that the supply of air in the ship's hull must necessarily be small, and that the lamp, once lighted, would speedily use up the oxygen, leaving him to suffocate. He was not, however, in absolute darkness. In some way the diffused light of day was reflected into his cabin through the water. It was a soft light—resembling that of the moon—but it enabled him to see perfectly. When the sun shone outside the weird light in his prison grew brighter, gradually ebbing away as darkness fell. Generally speaking, it was light from 6 a. m. till 6 p. m. During the long hours of daylight poor Engellandt worked unceasingly with his mallet, knocking continually on the ship's side. Was there ever such a monotonous, heart-breaking task—fighting against death in that floating tomb, with no better weapon than a hammer? For all he knew he was tapping out his own death-knell in those persistent strokes. What thoughts surged through his brain during those awful days! Thoughts of the wife and little ones at home, anxiously awaiting news of his ship's safe arrival in port—or possibly even now mourning him as dead, consequent on hearing news that a capsized galliot resembling his had been sighted. The probability of death in his floating prison he resolutely put from him, hoping continually for rescue—the rescue that was so long in coming. When night came he coiled himself up in some old sacks and a spare sail, which were stowed near the keel, and slept. He knew that at any moment, but especially at night, some ship might strike his all-but-submerged vessel and send him headlong to the bottom of the sea. Nothing that he could do, however, could avert such a contingency, and so this extraordinary man lay down calmly every night and endeavored to sleep, dozing off at intervals, but rarely losing consciousness for more than an hour at a time. And so the days of his imprisonment passed by, each hour seeming to have feet of lead. He had no watch or clock, but he could tell by the light whether it was day or night, and he made notches on a beam to record the passage of the days. He had not, of course, any idea of the direction in which the ship was drifting, but fancied it was S. S. E. The notches grew in number, the light came and went, the little store of food got smaller and smaller, and still there came no sign of rescue, no sound from the outer world. How would it all end? Would it be suffocation by the failure of the air supply, starvation when the food was exhausted or would the wreck sink witih him beneath the water and bring oblivion that way? Many a man would have gone raving mad under the awful strain, but this simple sailor-man still hoped for rescue, keeping up his tapping hour after hour and day after day, till the mallet was quite worn.

Once he thought the end was very near. It was evidently a bright sunshiny day outside, and the sun beating upon the ship's iron plates heated the air inside to such an extent that Engellandt was presently fighting for breath. He shifted his position lower down, near the water, but the air was scarcely better here, and it was with difficulty that he was able to breathe. It seemed as if everything was over. Then, just as he was about to give up the struggle, a gale arose, the sea became agitated, and with the rolling of the ship the air freshened. He was able to breathe easily once more, and for the time being the situation was saved. Whenever the sea was rough the air inside the hull seemed to be renewed, and the discovery of this fact removed his anxiety about the air supply. By this time thirst was beginning to trouble him somewhat, for no water was included in his slender stock. He was never really hungry, cooped up in that iron box, but he would have given much for a drink. There below him was water—dark and green and cool and inviting—but that way lay madness and death. Reckoning up his stores he found he had at most three or four days' food left. And there were now twelve notches on the beam! For eleven days and nights he had existed in that floating tomb, drifting along through the seas. No doubt the submerged wreck had been sighted many times, but no one had thought it worth while to investigate. Would it be so to the end? Would help never come? If the worst came to the worst and his stores were exhausted, Engellandt made up his mind to die fighting. He would put a lifebelt he had in the cabin round his waist, dive down into the water below, and endeavor to open those tight-jammed cabin doors and so reach the open sea. It was a mad venture and almost certain of failure, but he might as well meet death that way as by starvation or thirst in his iron prison. It was Thursday, the 30th, and drawing towards evening. The light was slowly fading from the water, and all was still as the grave. Poor Engellandt, thinking it useless to knock any more that day, had lain down on his sacks to sleep, when he suddenly started up, his pulse beating wildly. What was that sound? Was he going mad or were those footsteps on the plates above his head? Jumping up, he seized his hammer and knocked furiously, frantically, on the ship's side. A moment's silence, and then—thank heaven!—there came an

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answering knock. Help—so long delayed and all but despaired of—had arrived at last. But although only a thin plate of metal separated the poor prisoner from his rescuers, communication with him proved a difficult matter. All efforts to detach a plate failed, but finally a nut was loosened. Through the hole it covered the parties were enabled to converse. Engellandt learnt that his rescuers were the mate and two seamen of the Norwegian steamer Aurora, Capt. Soerensen. The wreck had been sighted some 16 miles off Rixhoft, and the boat had been sent to examine it. All the time the men were conversing the compressed air inside was escaping through the nuthole at a terrific rate. Capt. Engellandt, fearing that if the air was exhausted the ship would founder, asked the mate to replace the nut and tow him to the nearest port. The officer accordingly bade him good-bye, shut down the nut, and returned to the ship. A few minutes later towing commenced. On the way, curiously enough, the mainmast—which hitherto had been attached to the ship, with the mainsail set—was carried away. This mast, acting like a kind of center-board, no doubt assisted the ship to remain upright in her capsized condition.

The Aurora towed her strange prize into Neufahrwasser, the port of Dantzig. The astonishing news that the wreck contained a living man, who had been immured for nearly a fortnight, quickly spread, and large crowds gathered to witness his rescue. The capsized vessel was towed under a big derrick, a cable was passed around her, and she was raised just sufficiently to prevent her from sinking. Then engineers and shipsmiths got to work to cut out a plate from her bottom. A hole was first bored through, and immediately Capt. Engellandt's finger was seen protruding. He cried out a warning, fearing that the vessel would sink with the loss of air, but was assured that there was no danger now that the ship was suspended from the crane. The artificers worked with an energy born of sympathy for the man below, but in spite of all their efforts the task of cutting out the plate occupied nearly five hours. Then, at 9:45 p. m., the sheet of metal was removed, and Capt. Engellandt was hauled carefully out, after eleven days and eighteen hours' imprisonment in the ship's bottom. He was immediately seen by a doctor, but, to everyone's intense astonishment, was found to be little the worse for his appalling experience, save that he was nearly dying of thirst, having at last succumbed to the temptation and drunk a little salt water. His hands, too, were covered with blisters from his continual work with the hammer, and he was pale from his long confinement. But he was quite rational and able to walk ashore without assistance.

AN INQUIRY INTO THE SHIPPING COMBINE.

The editor of Fairplay, that very interesting, amusing, satirical, pro-British shipping paper published in London, has lately been in New York but is now safely arrived home again. As a rule, of course, impressions are expected when one has spent a week or so in a neighbor's land; and they are not lacking in Fairplay, though from what is said the sole object of the visit appears to have been an inquiry into the Morgan shipping combine. If there are any weak spots in this combination Fairplay is sure to find them out; and the following is published because it is interesting and not because it is so.

"Having recently spent some time in New York" says Fairplay, "naturally I did my best to ascertain the opinion of New York as to the genesis of the unlucky shipping combine. I availed myself of such introductions as I possessed and the following represents about the sum total of the information I obtained:

"Some three years ago, as will be remembered, negotiations took place for the sale of the Atlantic Transport Line to the Leyland Line. Those negotiations had been practically completed when, much to the surprise of the shipping community, it was announced that the deal had fallen through. It was never correctly understood how this sudden change had come about, but the hand of Mr. J. P. Morgan soon became evident, and I think it may be taken for granted that he was responsible for the abrupt termination of the negotiations. The reason will be understood when it is remembered that at that time shipping subsidy legislation was pending in congress, and the insiders, who were moving heaven and earth to put it through with the aid of the late-lamented Mr. McKinley, felt absolutely certain that a bill would pass that would enable foreign-built steamers, owned for the most part by American citizens, to be placed under the American flag. In full confidence that such a bill would become law, Mr. J. P. Morgan authorized the purchase of the Leyland Line, and it is said that Mr. Bernard N. Baker the president of the Atlantic Transport Line, who was very close to Mr. Morgan at the time on account of his financial relations with the Atlantic Transport Co., was the gentleman who acted for Mr. Morgan. It may be asked why Mr. Morgan, the banker, should purchase the Leyland Line, even with the prospect of putting the steamers under the American flag. The answer to that is that he was acting for the steel combine, the intention of which was to use the steamers, when under the American flag, for flooding Europe with their surplus products. I have it on very good authority that Mr. Andrew Carnegie's cheque paid for the Leyland Line. But these confident hopes were disappointed, and the expected subsidy failed to come off. Mr. Morgan therefore found himself with the Leyland Line on his hands, and practically the Atlantic Transport also, for undoubtedly he was providing the funds for their large building program. In this dilemma Mr. Baker, the president of the Atlantic Transport Line, came to the rescue with his pet theory of the combination of all the Atlantic lines, and he was doubtless commissioned by Mr. Morgan to start the ball in that direction.

"There was a very respectable beginning in the control of the Atlantic Transport Line and the Leyland Line. Apparently the American Line was first asked to cast in its lot with the intended combine, and the Standard Oil interests, which largely held its stock—but it never paid a dividend—were naturally not averse to getting rid of their load. It was an easy task, therefore, to bring this company into line. The parents of the combination realized as they went along that in order to float a big company successfully it would have to obtain an element of respectability to give weight to the scheme, and with that idea in view Mr. Pirrie was undoubtedly consulted as to the feasibility of bringing in the famous White Star Line. It was an open secret that since the death of Mr. T. H. Ismay the relations between Messrs. Harland & Wolff and the White Star company were not as cordial as they had been, and rumor had it that Mr. Pirrie and Mr. Bruce Ismay were not on the most affectionate terms.

"Mr. Pirrie being a power in the White Star Line, the way was thus easier for the absorption of that line, particularly on the favorable terms that were offered. It will be seen from what has been said so far that whatever the terms, the White Star Line had to be acquired to give tone to the scheme. How the Dominion Line was brought into the fold will be readily appreciated when it is remembered that Messrs. Harland & Wolff had built its fleet, and I think I venture a shrewd guess when I say that they held more of its paper than they cared for. What more natural, therefore, than that Mr. Pirrie should stipulate that the Dominion Line should be taken care of at the same time? The necessities of all these lines, with the exception of the tone-giving White Star Line, were therefore the real foundation of the big shipping combine, which in its initial stages so startled the shipping world. Naturally it suited the combine to have itself so well advertised as a terror-inspiring giant, which was to sweep all competitors out of its path, and prove the deathknell of British shipping. Even the staid British government was not unaffected, as we have seen in the remarkable agreements made with the Cunard Line and the combine. Our stolid German friends also trembled in their boots, and hastened to come to terms with the new power—and what a weakling that new power has proved to be!

"Mr. Morgan must laugh in his sleeve when he thinks of all the consternation he created, and the credit that was accorded to him for his alleged patriotic efforts to build up a great American mercantile marine, when he was engaged in nothing else than floating another trust for the benefit of himself and partners. He has a habit of not forgetting Mr. Morgan, and in this case it will be remembered that the Leyland Line, which Mr. Morgan and his associates had on their hands, received payment in cash instead of in paper—no common or preference stock for them. And what of the reputed railroad backing? It is, I am assured, an absolute fact that the combine is not supported even preferentially by a single railroad line in the United States, and consequently is on no better footing than any other Atlantic fleet. Another thing that militates against the trust is its fear of being brought under the operation of the Sherman anti-trust law, and it has its work cut out to avoid being branded as a monopoly, contrary to law. The extraordinary thing is that our government should have fallen into such a very palpable trap."

TRIALS OF BELLEVILLE BOILER SHIPS.

From Delaunay, Belleville & Co., French manufacturers of the well-known Belleville water-tube boiler, come reports of very satisfactory trials of vessels of war fitted with these boilers. The cruiser Babenberg, of 11,900 designed horse power, a vessel of the Austrian navy, underwent at Pola recently a full power test. The cruiser was expected to realize 18.5 knots at 136 revolutions per minute. She realized a speed of 20.6 knots at 149 revolutions and developed a maximum horse power of 17,011, as against her designed 11,900 H. P. The average horse power was 16,230 and average speed 19.67 knots. The excellent results shown in this performance of the Babenberg are proof of the thorough workmanship put into her engines by the Stabilimento Tecnico Triestino of Trieste and of the efficiency of her Belleville boilers, which are of the economizer kind. Another vessel similarly equipped as to boilers is the armored cruiser Admiral Aube of the French navy, which is of 20,500 H. P., and the preliminary trial of which took place at Cherbourg. This trial was to be one of six hours at 10,000 H. P. The power displayed in the course of this trial was 11,260 and the consumption of fuel per horse-power-hour was 566 grammes, with a combustion of 50 kilos per square meter of grate per hour. Later on, also at Cherbourg, the Admiral Aube was subjected to a four-hours' endurance trial at 14,000 H. P., which was highly satisfactory. The power displayed was 14,728 H. P., with fuel consumption of 670 grammes per horse-power-hour and a combustion of 87 kilos per square meter of grate per hour. Still later on this vessel at an increase to 19,305 H. P. the maximum combustion of fuel was 160 kilos per square meter of grate per hour.

One of the Gilchrist wooden schooners, the Yukon, has already gone into winter quarters at Ashtabula.

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SEEN AND HEARD ON THE LOOKOUT.

However true it may be that the sailors who manned the old-time wooden sailing ships never saved money, the days of the improvident "jack tar" are becoming a memory, as may be perceived by any one visiting the seamen's department of the British consulate in New York city during the hours of paying off ship's crews. In this office a man holding the dual position of special policeman and cashier urges any mariner who has received his pay at the consul's desk to deposit some of it in the seamen's savings bank, and that a great deal of money can thus be diverted from flowing into the channels that formerly swallowed Jack's earnings is evidenced from the fact that $70,000 has been deposited during the few months since this plan was adopted. Savings banks do not, as a rule, care to open accounts with sailors, for, when in port, they would be running there daily asking for money, so the bank in question, though obviously not prepared to pay interest, returns the deposit, or part of it, at all hours upon request. The cashier stated that the society which employs him often receives letters from the families of sailors expressing gratitude for the work done in the interest of those upon whom they are dependent. A sailor on the British steamer La Porte, paid off Sept. 17, holds the record at present for the amount of money saved, having deposited $1,200 on that date, requesting it to be sent to his mother. Fourteen sailors from the bark Arrow, chartered by the Standard Oil Co., deposited $1,642 to send to their homes. Any one, however remotely interested in shipping, must feel pleased that the days of the irresponsible, improvident seamen are passing, and that some of the advantages of living in the twentieth century are experienced by the inhabitants of the forecastle.

England is now said to suffer from a sailor famine, and as a disease is easiest cured by a removal of its cause a committee has recently been appointed to investigate the cause to which a scarcity of able seamen in the British mercantile marine must be attributed. The personal treatment the men before the mast receive from British officers compares favorably with that of sailors who ship under other flags, but it appears that the quality of the food served on board "lime-juicers," to say nothing of its quantity, deters sailors from "signing articles." It used to be a common saying on English vessels that, while God provided the meat the devil certainly must have had a hand in the furnishing of the cooks, and any one having had the misfortune to sample the average bill of fare as presented on a British tramp steamer must agree that said expression contains more truth than poetry. While British captains are careful to engage only seamen who can show certificates of discharge from other vessels for fear of having landlubbers foisted on them by boarding-house keepers, any one claiming to be a cook has a chance to get a berth as such, and many food spoilers are graduated from steamers' forecastles. As in the case of the mother who advised her daughter, when the latter complained of her husband's treatment, to "feed the brute," the English maritime authorities, who have ever taken great pains to maintain the high standard of their sailors' efficiency, are now intending to enforce a law making it incumbent upon masters to hire only regularly certified cooks, thus hoping to remove the principal cause of dissatisfaction felt in British forecastles by "feeding the brutes." It has been said that "a hungry stomach has no ears;" and should the English board of trade, while looking into this matter of food and its preparation, also devise some means to improve the accommodations as found on the average tramp steamer, we may safely predict that, notwithstanding England's erroneous merchant navy, the demand from capable, experienced A. B.'s for bunks shall greatly exceed the supply.

No doubt some of our eminent marine engineers are of the opinion that the limit of the reciprocating engine has been reached in such steamers as those belonging to the Hamburg-American line, which hold the speed record in the transatlantic passenger service, and as small vessels have been successfully equipped with turbine engines, managers of ocean greyhounds are, of course, asking if a gain in speed can be maintained as the size of the vessel increases. Rumors are heard of the intention of the Cunard Co. to equip its new 800-ft. ships with turbines, and it is said that two of this company's representatives were present during the trials of the American turbine yacht Revolution. On all hands it is agreed that the turbine may ultimately revolutionize ocean travel, but it is hardly likely that a steamboat company would risk installing types of engines that have not as yet been tried on a very large scale into boats costing approximately $5,000,000. Steamboat owners who wish to keep abreast of the times are giving some credence to the outspoken praises emanating from the enthusiastic believers in the turbine's superiority, and the North German Lloyd, for instance, intends to have one of their older boats overhauled preparatory to having her fitted with the engines in question, with a view to decide, after exhaustive tests, the advisability of entirely changing the machinery of their larger vessels. If true, said an engineer of a turbine propelled yacht recently built in Europe, that the cost of operating these engines is less than that of the reciprocating type, the decrease is due to other causes than to the saving of fuel, as claimed by some. In this age of inventions and scientific revelations no one can know what to expect next, but all agree that, as regards the turbine engine, there are probabilities of great possibilities, while many predict that it is going to be the future ship's engine exclusively.

A Dutch marine journal comments at great length on the cost of repairing and docking vessels in this country, and to illustrate the difference between the price asked by American ship yards and charges for similar work in European ports, the writer of the article cites the following incident: "The Italian ship Erasmo of 2,157 tons register recently put into Philadelphia in distress. After inquiring as to the probable cost of repairing the damage in a Philadelphia ship yard, the ship's agent discovered that the vessel could be towed across the Atlantic to her home port, Genoa, and have the necessary repairs effected, in addition to the charges for towing, cheaper than could be done in an American harbor. Even the bids of American towboat companies were rejected as excessive, and the powerful Dutch tugboat Titan was ordered from Amsterdam, Holland, for the purpose of escorting the Erasmo from Philadelphia to Italy." The amount or the nature of the damage sustained by the Italian ship was not stated, but the incident has certainly prompted interest in maritime circles as to the difference between the charges of the American and Italian ship yards. In this case, if the story is true, the difference must have been enormous to cause the owners to risk their disabled ship on a record-breaking towing trip, without even further mentioning the necessarily heavy expense of chartering a tug hailing from a port 3,000 miles across the Atlantic.

ANTI-FRICTION JOURNAL BEARINGS.

The Stickel Machine Co. of Williamsport, Pa., with offices in Pittsburg, Chicago, Cleveland and other manufacturing centers, has just undertaken the introduction of a patent anti-friction journal bearing for which an enormous demand is predicted, on the score that it is a great improvement over all similar devices. The Cleveland offices of the company are in the Western Reserve building. Hon. Chas. H. Aldrich, formerly solicitor-general of the United States, is president of the company, Jacob Stickel, M. D., the inventor, is vice-president, and Mr. N. McKusick of Williamsport, Pa., secretary The invention is said to be applicable to bearings generally, whether the box be stationary and the journal rotative, the axle be fixed and the box rotative, or both be rotative; in other words wherever a shaft revolves in a box or a box revolves on a shaft—all journal bearings. The company proposes to first take up the matter of loose pulleys and shaft bearings in factories, putting the device in on trial wherever necessary, and later give attention to the vehicle trade, street car trade, etc. It is expected that the cost of the pulleys will not be much if any more than cast-iron pulleys. One of the officials of the company says of this roller bearing:

"There are several roller bearings on the market, but they all required more or less oil to prevent friction, as the rollers either worked loose within the box, coming in contact with each other, or the ends worked in sockets. In our roller bearing the rollers are loose, but are kept apart by the balls at the ends. You roll along a table, two rollers, and keep them from touching, and you will never create any friction between the table and the roller, nor between the rollers. There is no pressure on the balls in keeping the rollers apart. There is no wear on the end plates, as the balls project beyond the end of the rollers. By using bushings we overcome any uneven surfaces that might occur on shaft or pulley. The saving of power will be a great thing to manufacturers."

Some of the strongest possible statements concerning the efficiency of the bearing as accomplishing what it aims to do have been given the makers. One instance may be quoted. An operator of a mortise machine in a planing mill writes: "Connected with said machine there is a pulley equipped with your bearing running at a speed of 1,000 revolutions per minute during working hours. It has been three months since that pulley was attached to my machine, and during this time no oil or other lubricant has been used upon any part of the pulley or its bearing."

Mr. Edward Ramage, well known in Canadian ship building circles, recently severed his connection with the Bertram yard at Toronto, with which he had been connected as foreman for almost a decade. Some of the finest freight and passenger steamers of Canada plying on the lakes and the St. Lawrence were built at the Bertram works in Mr. Ramage's time, among them the passenger steamers Toronto, Kingston and Montreal and the freight steamers Ottawa, Iroquois and Tadusac. When leaving the employ of the Bertram company, Mr. Ramage's friends and associates took occasion to express their esteem by presenting him with an elegant roll-top writing desk. Mr. Ramage in expressing his appreciation of the gift, stated that it would become a very useful article to him as it was his intention to at once establish, on a small scale, a ship building business of his own, principally taking care of repair work, steam launch work, and other structural iron and tank work. He was not prepared to say just where he would locate, but he thought Toronto would offer due facilities as a suitable location. He also added that he had already purchased a number of ship yard tools suitable for the work he intended to do.

The amalgamation of the firm of Laird Bros., ship builders of Birkenhead, and the Cammells, the steel and iron manufacturers of Sheffield, was ratified by the shareholders this week.

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MISCELLANEOUS MATTERS.

Orders have been received at the Portsmouth navy yard to build two steel barges to cost $28,000 each.

A notice from the Railway Appliances Co. of Chicago announces that Mr. C. F. Quincy has been elected president of the company to succeed Mr. H. K. Gilbert, resigned. Mr. Geo. H. Sargent was elected vice-president and Mr. Percival Manchester secretary and treasurer.

At the works of the Electro-Dynamic Co., Philadelphia, known to the marine trade especially on account of its electric steering gear, some difficulty is still encountered in keeping up with orders. Mr. M. Pfatischer, chief engineer, has just left for an extended trip through France, Germany and Russia in the interest of the company.

The latest addition to the Nantasket Beach Steamboat Co.'s fleet was launched at the Montgomery ship yard, Chelsea, Mass., last week and named Old Colony. Her dimensions are: Length, 190 ft.; beam, 32 ft.; depth of hold, 12 ft. She will be equipped with a single inclined surface-condensing engine, 50-in. cylinder and 8 ft. stroke of piston. She will have all modern improvements and will cost complete $135,000.

The United States Graphite Co., Saginaw, Mich., who mine and prepare the new graphite lubricant known as No. 205 lubricating graphite, are anxious to put a quarter-pound sample of their product in the hands of every interested ship owner and marine engineer. It is claimed that this product, besides being a high-grade lubricant, is very readily convertible into an ideal yet inexpensive preservative paint for smokestacks, roofs and other exposed surfaces. Printed matter gives complete directions for this special use. It is suggested from a practical standpoint that ship owners make an inexpensive trial of this product by the painting of a smokestack or other exposed surface on some one of their vessels before going into winter quarters.

Rear Admiral Louis Kempff was placed on the retired list this week on account of age. He commanded the United States naval forces at Taku, China, in May, 1900, during the attack of the allied fleet on the forts defending that place. When the foreign admirals decided to make the attack Admiral Kempff asked the navy department if he should participate and was told to use his own discretion. As the United States was not at war with China, Admiral Kempff declined to take part in the bombardment of the forts. For this course he was commended by congress. In consequence of Admiral Kempff's retirement four captains will be promoted to rear admirals. These captains are Benjamin P. Lamberton, French E. Chadwick, Bowman H. McCalla and William H. Whiting.

In an interview on the steel situation President A. W. Thomson of the Republic Iron & Steel Co. says: "It is useless to assure Wall street that the country is prosperous, but nevertheless trade conditions in the west and northwest are excellent. The iron and steel business is not enjoying the enormous tonnage of last year, but it is in fair condition. In our case, we are well booked up with orders to run us through into the new year, and a healthy sign is the fact that orders are being received just now for prompt delivery. Several recent demands were of this kind, calling for immediate shipment, indicating that stocks on hand are low. The conditions in Wall street are puzzling and hurtful to business to some extent. So far as I hear, manufacturers' stocks in wholesale houses have never been so low as today, and the wholesale hardware trade has seldom, if ever, been busier."

It was announced in New York this week that the directors of the United States Ship Building Co. had issued a call for the annual meeting of the stockholders on the regular date, Oct. 21. When a representative of Receiver James Smith, Jr., learned that this call had been issued he said that if anything was done at this meeting contempt proceedings might result. It was a question, he said, if the directors had not put themselves in contempt of court by their meetings on June 22 and by the selection of four directors for the Bethlehem Steel Co. after a receiver had been asked for. On behalf of the directors it was said that only a general consideration of the company's affairs would come up at the meeting and that there was no intention of usurping any of the prerogatives of the receiver or to disobey the injunction. The suit of the bondholders for the appointment of a permanent receiver will be heard this week.

The Baldt Anchor Co. at their works in Chester, Pa., have now under construction over 1,000,000 lbs of anchors. Some are being made for export and others for the home merchant marine. For the United States navy, for use on battleships and cruisers, the Baldt company is making sixteen anchors of 16,500 lbs each and six of 13,000 lbs each. They carry in stock a large number of anchors, varying in size from 500 to 10,000 lbs. They have just shipped to Greenport, Long Island, four anchors, to be used on government dredges. This company is greatly pleased with the outcome of a recent test of anchors made by the navy department. The Baldt anchor met with special approval on account of its great strength and also for its stowing qualities. The claim for great strength is based upon the manner of construction—hinged upon the ball and socket principle, with no pins to bend or break. Officials of the company claim they have never had an anchor break on them in service, except as a result of collision, and that there is only one instance of that kind.

Hunters' Special Rates.—Via Nickel Plate road to points in northern Michigan and Wisconsin. Tickets on sale Sept. 15 to Nov. 15, '03, inclusive. Liberal return limit. See nearest agent for particulars or address E. A. Akers, C. P. & T. A, Cleveland, Ohio. Oct. 23 (173).

BELLEVILLE WATER-TUBE BOILERS

NOW IN USE (SEPTEMBER, 1903)

On Board Sea-going Vessels, NOT INCLUDING New Installations Building or Erecting.

French Navy	355,560	H. P.
English Royal Navy	929,300	"
Russian Imperial Navy	227,500	"
Japanese Imperial Navy	122,700	"
Austrian Imperial Navy	56,700	"
Italian Royal Navy	13,500	"
Chilian Navy	26,500	"
Argentine Navy	13,000	"
The "Messageries Maritimes" Company	87,600	"
Chemins de fer de l'Ouest: (The French Western Railway Co.) Steamships plying between Dieppe and Newhaven	18,500	"
Total Horse Power of Boilers in Use	1,850,860	

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WAR TEST OF THE EUROPA.

Concerning the war trials of the British cruiser Europa, the special correspondent of Engineer of London says:

As a complement to the details I recently gave of the "war trial" cruises of the Spartiate and Europa, designed by Rear-Admiral May, the following details may be of interest to those who follow the battle of the boilers. At the conclusion of her voyage to Hong Kong and back, the Europa remained fourteen days at Portsmouth. No repairs were effected in her Belleville boilers during this period. She was then sent to sea for the maneuvers with a mobilized crew. These were purposely selected at haphazard, and of 120 stokers, sixty were raw second-class stokers who had not been to sea before. During the maneuvers she steamed 5,600 miles, and burned 2,500 tons of coal. For the first eighty-eight hours of the "war" she had all boilers continuously in use, and for fifty-eight hours on stretch was at top speed. At high speeds her average consumption per indicated horse power was from 1.9 lbs. to 2 lbs.

During the "war" no defects of any sort occurred, but on the voyage home an indicator pipe exhibited a slight crack. Many of the raw stokers were sea-sick in the earlier stages of the cruise, and for twenty hours the remainder had to be put into two instead of three watches. In this way no difficulty was experienced in maintaining speed with the proper engine room complement. Only the usual deck hands were below trimming coal in the bunkers—forty-eight men in three watches. No deck hands were employed on the fires, the boilers being kept going entirely by those stokers who were not incapacitated by sea sickness. No defects of any sort other than the indicator pipe already mentioned were noted at the expiration of the trip. The total trial mileage was thus brought to over 25,000 miles of practically continuous steaming, the fortnight's delay at Portsmouth having been caused by the ship reaching Portsmouth sooner than had been expected from the China trip. There was no appreciable loss of water, and ample quantities were always available. A point of special interest in connection with the Europa is that all except the three top rows of her boiler tubes are the original tubes, now some five years old. The practice was to use lime, so as to coat the insides of the tubes; forced draft was then employed on all possible occasions. This is the exact opposite of the system employed in the Spartiate, but both seem to have been equally satisfactory.

The supreme value of these trials, as opposed to the Hyacinth-Minerva trials, is that they were under "war conditions." This, amongst other things, such as raw stokers, chance staffs, and coal "as it comes," means that a ship while doing full speed is liable to be stopped dead at any moment, with, of course, a corresponding strain upon the boilers. In theory, of course, such strains should not be given, but till naval captains know a good deal more about naval engineering than they do at present boilers will always have to stand the chance. In action, too, such sudden stops will have to be made, and boilers that cannot stand it must go to the scrap heap, whatever other virtues they may possess. We can hardly, therefore, quarrel very much with the imposition of such "savage tests" in peace maneuvers, especially when these form part of a "war trial." Indeed, it is to the national advantage that they should be made, and it is satisfactory to record that the Europa's boilers—despite their age and their special condemnation by the boiler committee—came through the test with complete success.

WE MUST HAVE SHIPS.

By Walter J. Ballard.

What we require in order to obtain control of the coal trade of the world are transportation lines and new business connections which will secure return freights for our coal ships.—Simon W. Hanauer, deputy consul-general, Frankfort, Ger.

American shipping under the American flag should be found in all oceans, and our trade must go where our flag goes.—William McKinley.

The traffic of the Kaiser Wilhelm canal in 1902 covered 32,010 ships of 4,573,834 tons. The flags represented by these were: Germany, 27,174; Holland, 1,419; Denmark, 1,217; Sweden, 982; Great Britain, 505; Norway, 338; Russia, 301; Belgium, 24; France, 13; all others, 37. Again American ships are missing, unless one or two are included among the "all others."

Following is a dispatch from Pensacola, Fla.: "Over 31,000,000 ft. of sawn lumber and timber were shipped from this port during the month of September, 1903. The bulk of these shipments went to foreign ports, going to nearly all the countries of the world. The shipments made during the month were 24,100,000 superficial ft. of sawn timber, 6,005,000 superficial ft. of lumber, 14,718 cu. ft. of hewn timber. The value of the shipments reached $868,006." But unfortunately nearly all of it went in vessels flying foreign flags.

On the whole, the facts presented by the tabulations of the British board of trade prove the wisdom of the American policy of protecting the home markets and of the British policy of protecting the shipping trade, and the United States ought to learn therefrom not merely the propriety of continuing to foster American industries, but the advisability of extending a fostering care to the ocean carrying trade, which is the weak spot in our national armor.—Pittsburg Gazette.

It was William McKinley who said: "Congress should give prompt attention to the restoration of our American merchant marine, once the pride of the seas in all the great ocean highways of commerce. The question is one that appeals both to our business necessities and the patriotic aspirations of a great people."

Mr. McKinley further said: "May we not hope, with our expanding markets and our increasing export trade, at no very distant future to rehabilitate our merchant marine, and send our ships of commerce into every ocean, carrying American products under the shelter of the American flag?"

DISCRIMINATION THE ORDER OF THE DAY.

Editor Marine Review:—In your article on page 27, issue of Oct. 1, you hit the mark squarely. There is no other practical way to recover our lost ocean carrying trade than by the principle of preferring our own to foreign vessels. There is nothing new in this. All nations have, as a general thing, pursued this plan. We have been more free to employ foreign vessels than any other people, but, having by this course lost our carrying trade, we must quit it and take care of our own rights and interests in the future.

My measure, just completed, will not discriminate against foreign merchants sending goods to our ports *direct* from their own countries in *their own* ships. *Indirect* commerce and navigation will bear the brunt of adverse discrimination. This will hit England hard, as it should do. The idea of any single country setting out to monopolize the carrying of the world will not go, no matter what reasons may be given for it. All nations want and will ultimately have what carrying *belongs* to them.

WM. W. BATES.

Denver, Col., Oct. 6, 1903.

ITEMS OF GENERAL INTEREST.

Capt. William S. Cowles, President Roosevelt's brother-in-law, has been ordered to take command of the battleship Missouri.

At the instance of the Holland Submarine Torpedo Boat Co. the navy board of inspection and survey has agreed to postpone the general trials of submarine boats to Nov. 15. The Holland and Lake companies will be the only ones that will take part in the tests.

The storm of last week in New York and vicinity nearly resulted in a cave-in of the $3,000,000 dry dock in the Brooklyn navy yard. The battleship Massachusetts was in the dock at the time and it became necessary to run huge braces from the ship to the sides of the dock to prevent the sea from crushing the sides in.

News of an accident to the cofferdam of the new dry dock nearing completion at Portsmouth, N. H., reached the navy department in the form of the following telegram from Capt. Casper, commandant of the Portsmouth navy yard: "About 50 ft. of the east end of the cofferdam of the new dry dock washed out. Dock filled with water. No one injured or killed."

Secretary Cortelyou of the department of commerce and labor had a conference recently with representatives of the Maritime Exchange and the shipping interests generally of New York concerning marine affairs. Among the questions discussed was that of the construction of a vessel especially fitted for the removal of derelicts and other obstructions to navigation along the North Atlantic coast.

Sir Thomas Lipton has taken the first steps to project what might indeed be considered serviceable rivalry in yacht designing and sailing. He has announced his intention of giving to any yacht club that will serve as guardian a perpetual challenge cup, to cost $2,500, for a race to be sailed annually from Sandy Hook to the Needles, the race to be open to all sloops, schooners and yawls without allowances or restrictions of any sort. This would undoubtedly stimulate the design of ocean-going yachts and would certainly have great cruising significance.

Three months ago the Cunard Line served notice that it would withdraw from the Atlantic conference. The German lines have now served notice of withdrawal also, and a rate war is looked for. The trouble originally started by the projection of a Scandinavian line into the trade with Norway which was apportioned to the Cunard company exclusively. When, as an offset, the conference refused to permit the Cunard Line to share in other trades the line served notice of withdrawal and entered the Mediterranean field in competition with the German lines.

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TRADE NOTES.

The American Ship Windlass Company's new foundry at Providence, R. I., was put in operation a few days ago, and is now prepared to furnish iron castings of all styles promptly. Those who are familiar with the superior class of windlass work and other specialties turned out by this company and are users of castings, will no doubt avail themselves of the opportunity of this corporation's output in this line.—Marine Journal.

The Brooklyn Engineers' Club held the first meeting of the season on the evening of October 8. Besides the usual formal business, a very interesting paper, entitled "A History of Pumps, Ancient and Modern," was read by Mr. John A. Drew of the Worthington company. Mr. Drew sketched the development of pumping machines from the early Egyptian "Noria," resembling the familiar well sweep, to the latest triple-expansion, condensing, water-works pumping engines, requiring little more than a pound of coal per horse-power-hour. The paper was illustrated by a large number of lantern slides.

Dixon graphite pipe joint compound, made by the Joseph Dixon Crucible Co., Jersey City, N. J., is rapidly pushing to the front. The company reports that large orders are constantly coming in, while the trade in smaller packages, which is handled by the dealers, is also increasing. One concern recently ordered 600 pounds in small packages for use in its various plants. This compound is used to good advantage on all pipe joints, gasket surfaces, bolts, water tube caps, and in many other places on steamships. The Dixon company will be glad to send prices and samples to anyone who will drop them a postal.

Authorities of the Louisiana Purchase Exposition are taking every precaution to prevent the recurrence at St. Louis of any such disastrous fire as that which destroyed the great cold storage building at the Chicago exposition in 1893, and are making adequate provision for water supply by putting in the largest installation of fire pumps in the world. These pumps, which have been purchased from Henry R. Worthington of New York city, comprise twelve, 1000-gallon, standard underwriter fire-pumps, each capable of supplying four fire streams, making it possible to have forty-eight fire streams in use at one time. The pumps are of the duplex, double-acting type and are supplied with air and vacuum chambers of large capacity. The fittings are of composition metal throughout and the piston and valve rods are of bronze. Every measure has been taken in designing these pumps to insure that they will start at a moment's notice at any time after having been idle for a long period. They are the pumps recommended by the Associated Factory Mutual Insurance Companies and, in fact, formed the basis of the specifications for fire-pumps adopted by the associated companies.

FOR SALE.

SMALL

CANADIAN STEAM BARGE

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ADDRESS OR CALL ON

SAND & DREDGING, LTD.,

TORONTO, CANADA.

Oct. 15.

Galveston, Texas, Oct. 7, 1903.

Sealed proposals, in duplicate, for grade raising at Galveston, Texas, involving over 11,000,000 cubic yards of filling, will be received by the Chairman of the Grade Raising Board, until 2 P. M., Dec. 7, 1903, and then publicly opened. For information apply to E. R. Cheesborough, Secretary Grade Raising Board, Galveston, Texas.

Dec. 8 C. S. RICHE, Consulting Engineer.

Dredging Plants for Sale.

For Sale.—Two dredging plants complete, consisting of two dredges, tugs Maytham and Duncan Robertson; also five dump scows and two flats, with sundry duplicate parts of machinery, etc.; also extra spud anchors and dipper teeth, etc.; all having been kept up in good working condition and comparatively new, and could be delivered at once on satisfactory sale. For further information as to capacity and prices of each plant inquire of James Pryor, Houghton, Mich. Nov. 12

$5,000 Buys Steamer Inter Ocean

Length 214 ft., beam 36 ft. Capacity 1600 tons. Steeple-compound engine Boiler allowed 110 lbs. steam. Address C. S Mahoney, 17 Main St., Buffalo, N. Y. tf

Schooner for Sale.

For Sale—Schooner Howlett, 127 ft. long, 29 ft. beam; carries 200,000 ft. of lumber. Outfit nearly all new. Boat in good condition Enquire McCracken Bros., Muskegon, Mich Oct. 15

WHITE OAK

TIMBERS, PLANK AND DIMENSION STOCK

F. S. SHURICK,

18 Broadway, NEW YORK CITY

For Sale—A Bargain.

Two Brown Hoisting Machinery Company, all iron and steel, post jib cranes.

One 15-ton capacity 35 ft. 3 in. radius of hook, 18 ft. 6 in. lift.

One 3-ton capacity 19 ft. 8 in. radius of hook, 10 ft. 2 in. lift.

The hoisting mechanism of both cranes is driven by dust-proof motors They are in excellent condition and have been very satisfactory machines.

A. GARRISON FOUNDRY COMPANY,

Pittsburgh, Pa.

Package Freight Steamers for Sale.

For Sale.—Steamers JOHN C. GAULT and RUSSELL SAGE; 1,200 tons capacity; *complete fit out for package freight.* Inland Lloyds rating, A2. Compound engines and two marine boilers in each boat; in fair condition. For particulars address A. W. Colton, Toledo, O Oct 29

Tug for Sale.

Tug Warwick—Engine 15x17. Boiler allowed 110 lbs. steam. Both in first-condition. Hull practically new. Boat inspected and ready to run. Cheap for cash. Can be seen at Toledo, O. Apply to James Rooney, 1118 Collingwood ave, Toledo, O. tf

Boiler For Sale.

For sale cheap. Scotch marine boiler 10 ft. by 78 in triple riveted, ⅝ steel plate, dome 6 ft by 24 in, 98 three inch tubes, stays ⅝ center; allowed 168 lbs steam pressure. Boiler is now working and is as good as new. Address I. Applebaum, Detroit, Mich. tf

Small Steam Barge for Sale.

I have for sale a small steam barge Carries 250 tons. Address, Capt F. E Wood, Alexandria Bay, N Y. tf

Steamer and Tow Barge for Sale.

Lake steamer and tow for sale. Total tonnage 1,000 Equipment complete A-1 condition. Address, G. M., care Marine Review Pub. Co., 39-41 Wade Bldg., Cleveland, O. Oct. 15

A. J. MORSE & SON.

DIVING APPARATUS

140 CONGRESS ST. BOSTON.

Gasoline Engine for Sale.

For Sale Cheap—One 16-H. P. Superior gasoline engine. Used less than three months. Address Alpern & Co., Alpena, Mich. Nov. 12

For Sale.

Tug Duncan City. Address, Geo. Pankrantz Lumber Co., Sturgeon Bay, Wis. tf

Two Steamers Wanted.

Cash will be paid for two steamers for Pacific trade if found suitable as to dimensions, etc. Wooden boats will not do. They must be of iron or steel. The first vessel should be of 180 to 210 ft. length, 30 to 33 ft. beam, with 11 to 13 ft. draught aft when loaded with full dead-weight cargo. Speed from 8 to 10 knots per hour. Accommodations for about twelve first-class passengers. Capacity to be of 600 to 900 tons dead-weight. Length of the second vessel should be 135 to 150 ft.; beam 24 to 30 ft.; draught aft loaded with full dead-weight cargo, 8 to 9 ft.; capacity 300 to 500 tons dead-weight cargo; speed from 8 to 10 knots per hour, with accommodations for about ten first-class passengers. Address Box 51, The Marine Review Pub. Co., Wade Building, Cleveland, O. tf

Tug for Sale.

Length 75 ft., breadth 13.9 ft, depth 7.6 ft. Enquire H. Heinecke, Sheboygan, Wis. Oct. 29

Wanted Situation as Oiler.

Position wanted as oiler on lake vessel by party who is willing to work and anxious to get engineer's papers. Has had eight years' experience as stationary engineer. At present superintendent of a large steam plant. Can produce best of recommendations Address Box 50, Marine Review Pub. Co., Cleveland. tf

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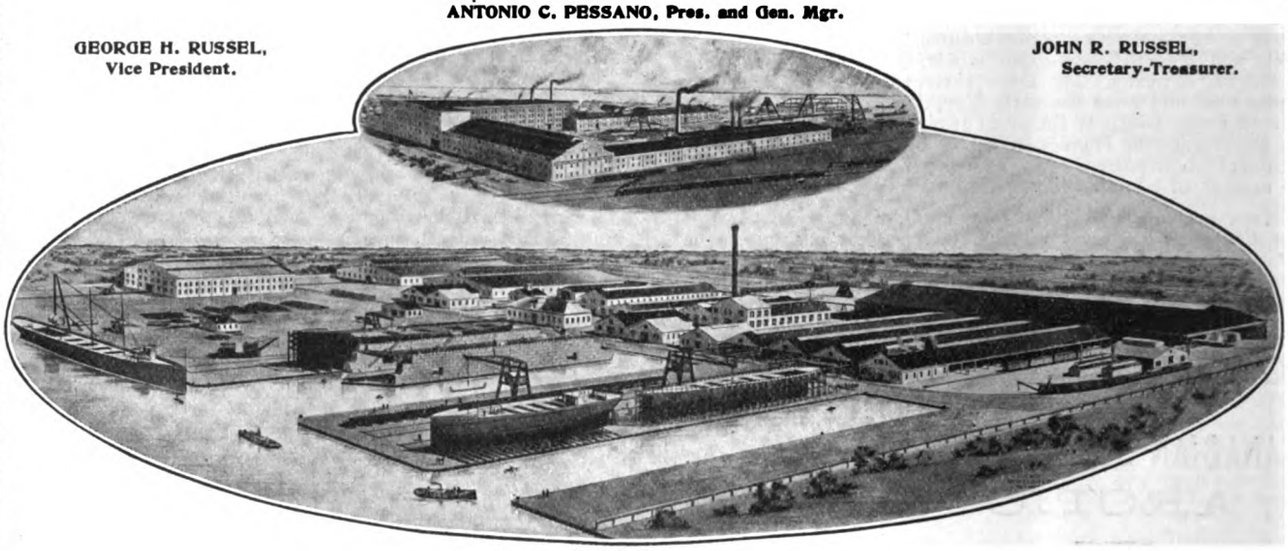

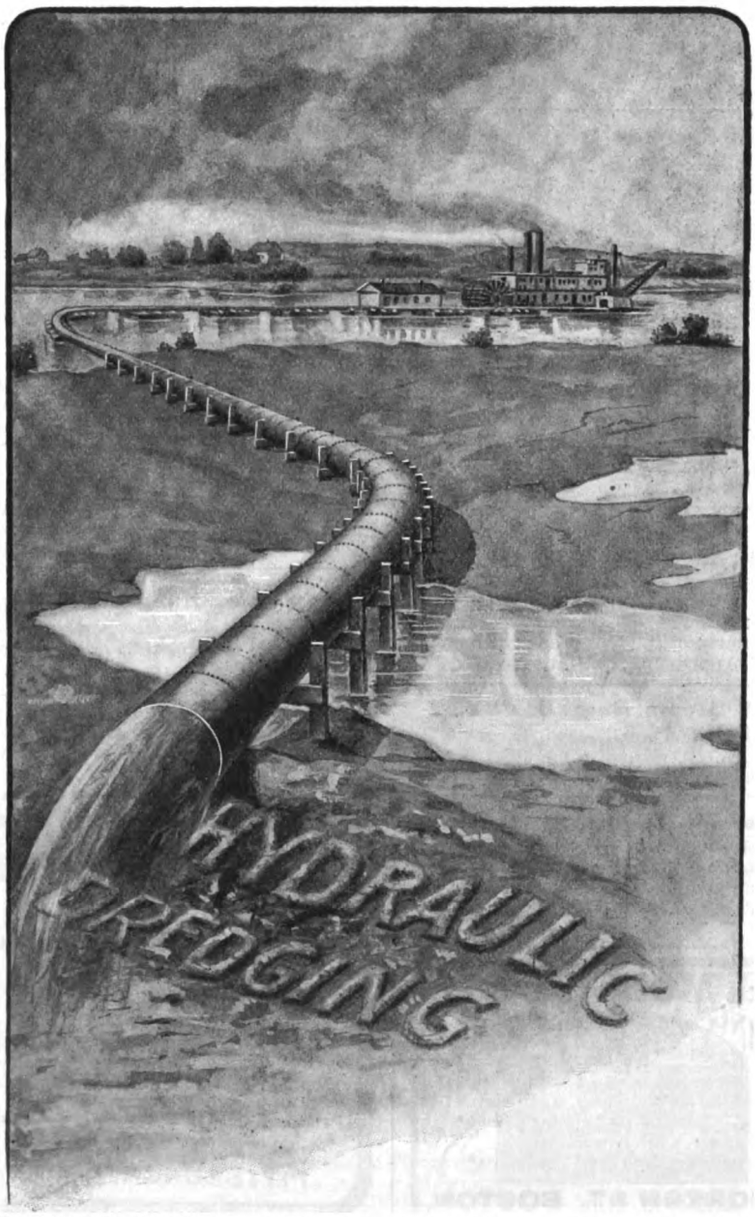

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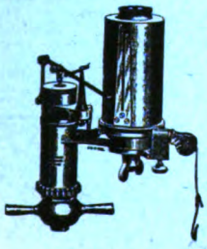

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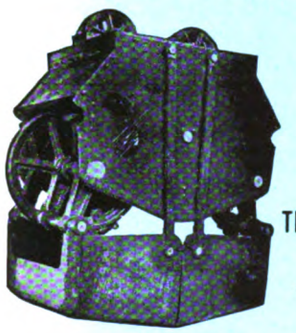

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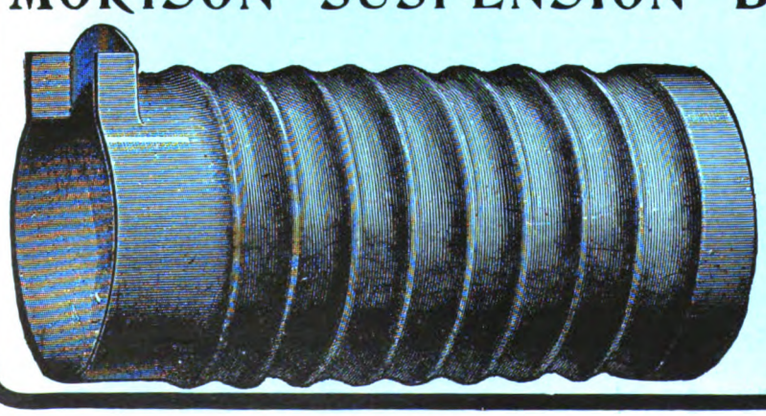

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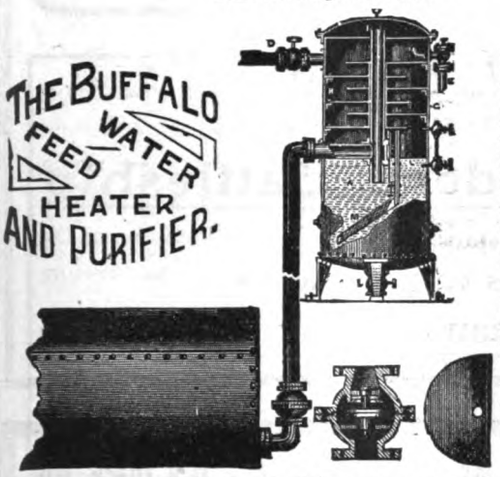

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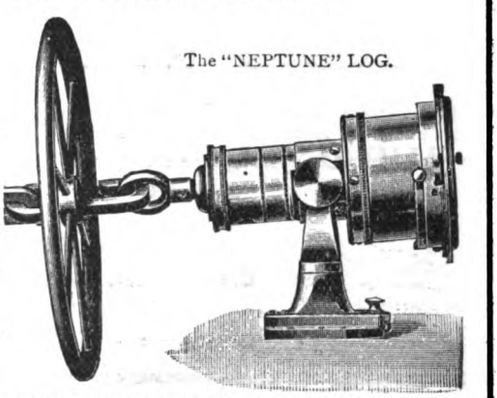

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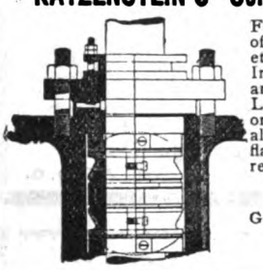

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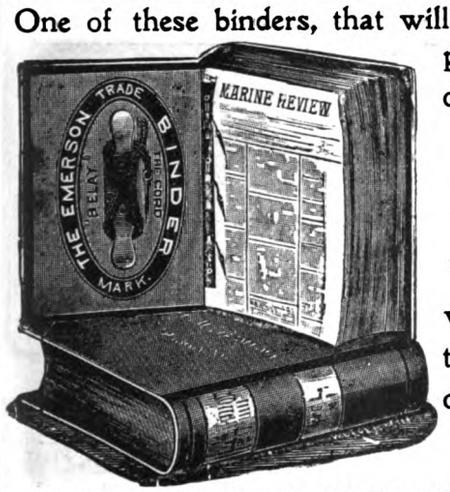

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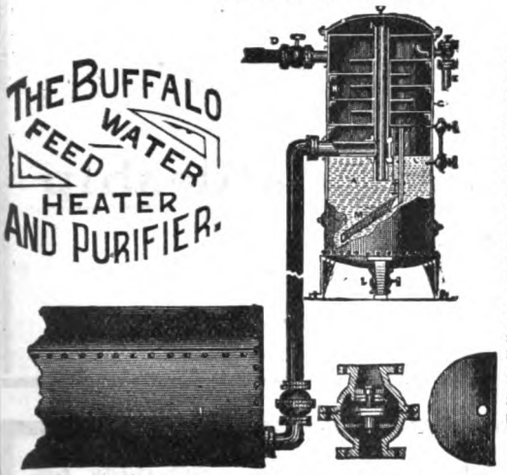

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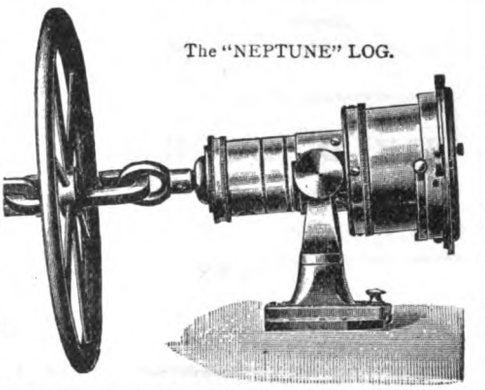

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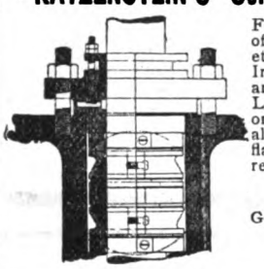

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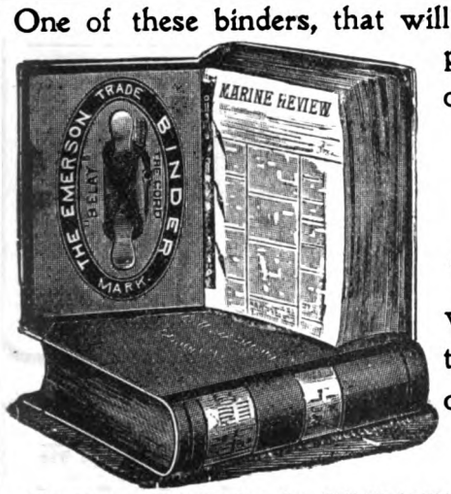

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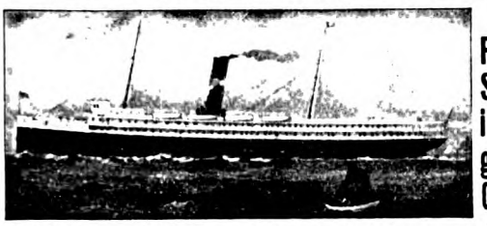

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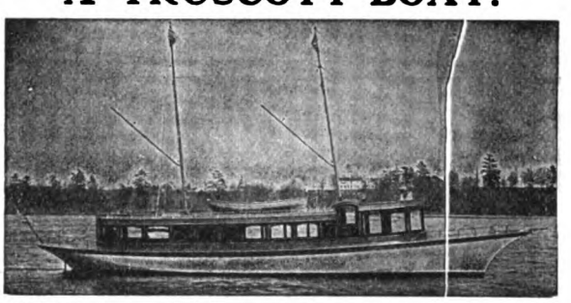

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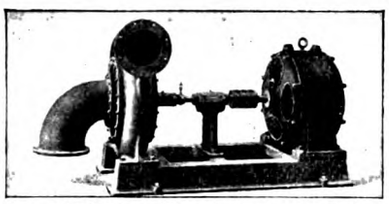

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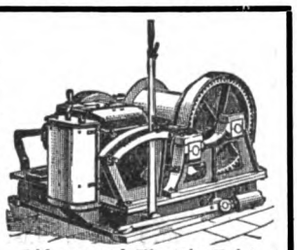

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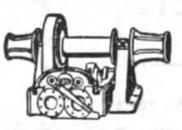

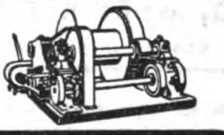

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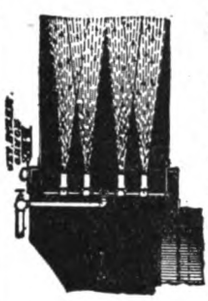

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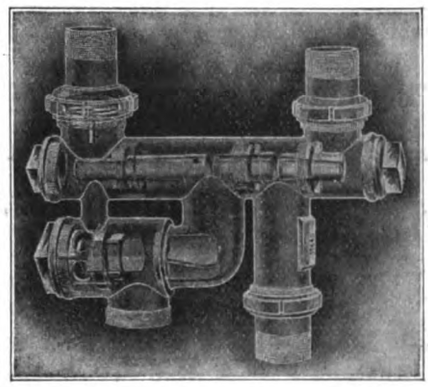

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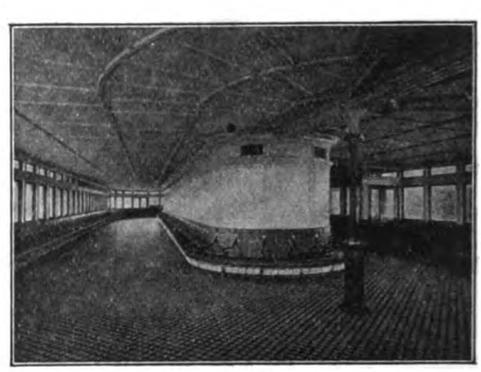

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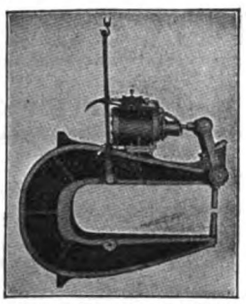

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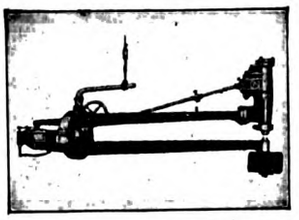

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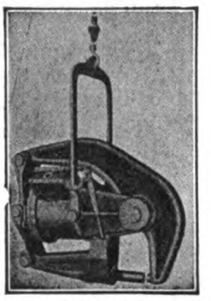

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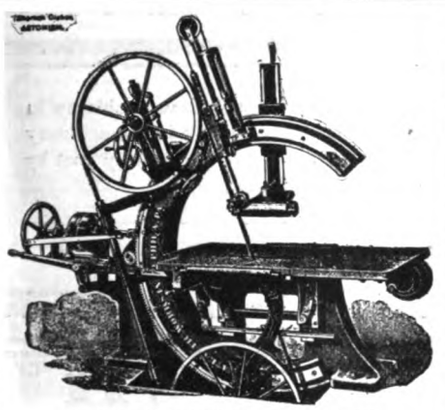

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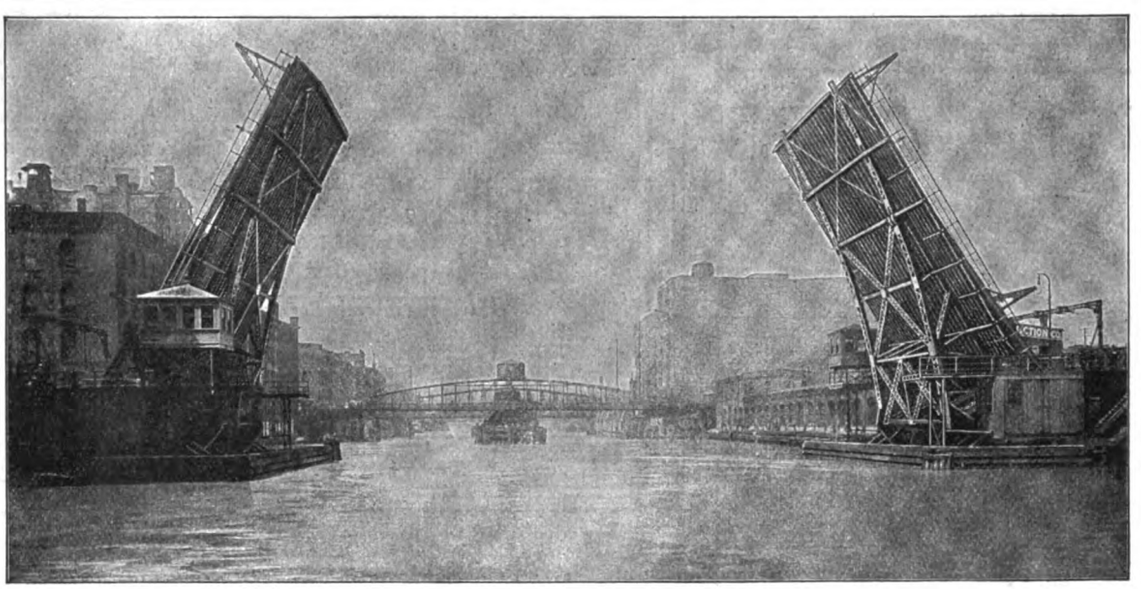

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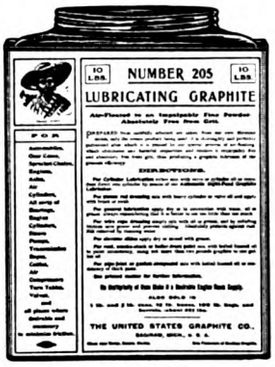

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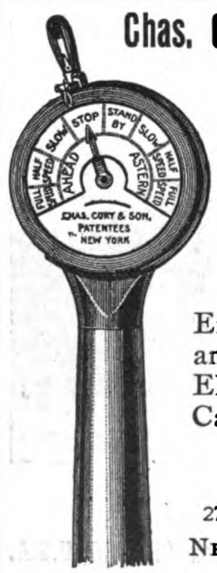

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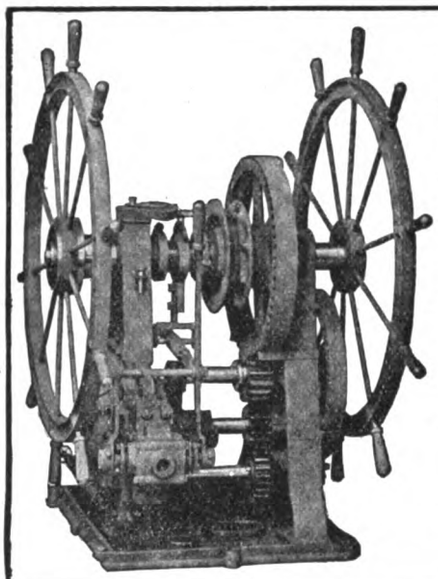

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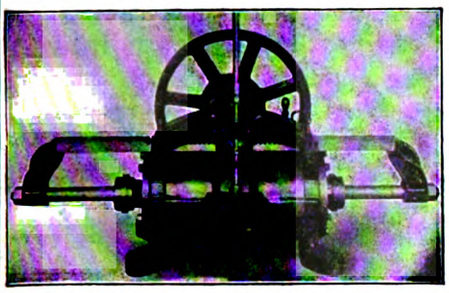

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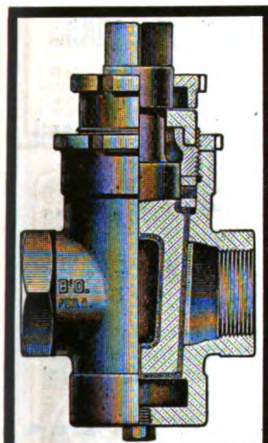

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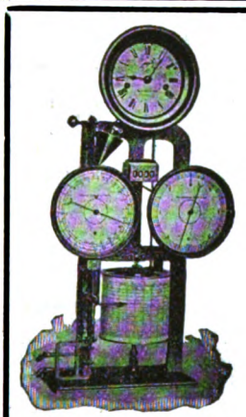

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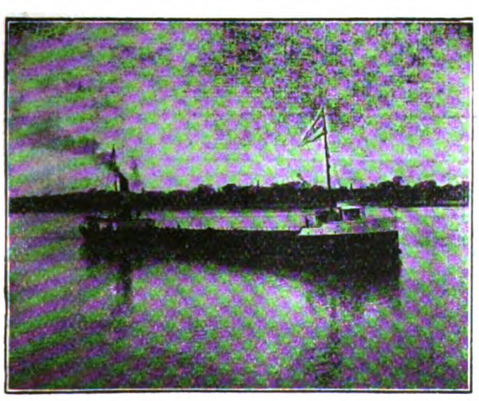

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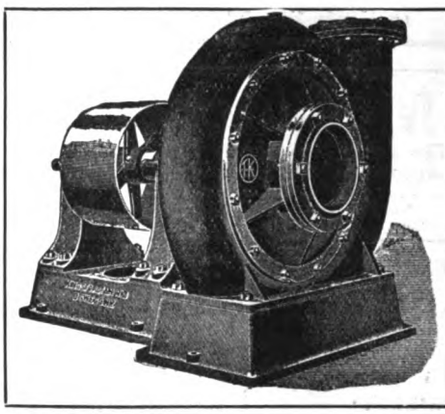

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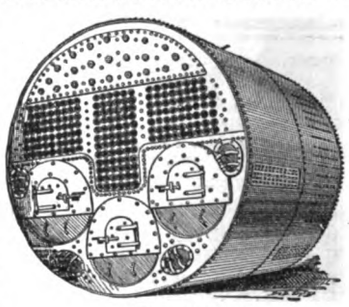

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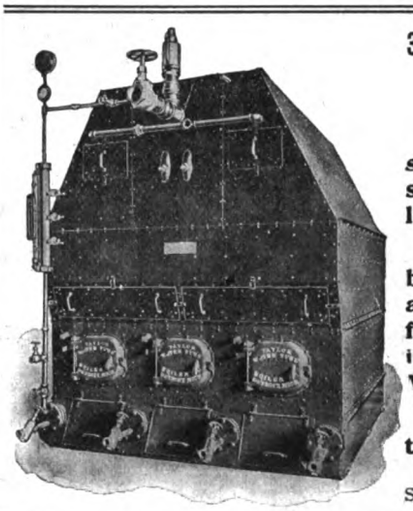

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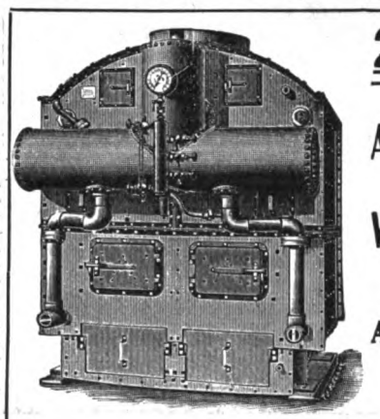

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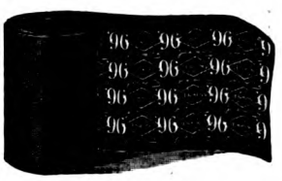

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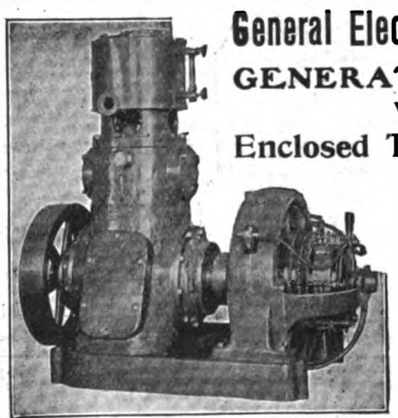

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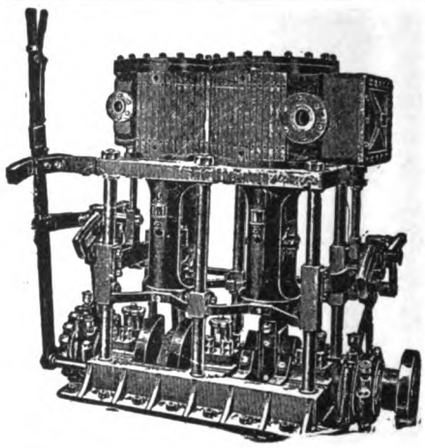

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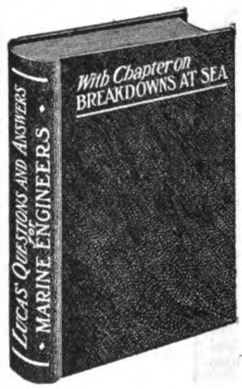

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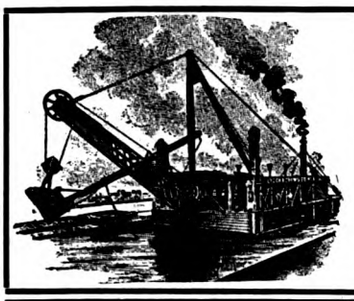

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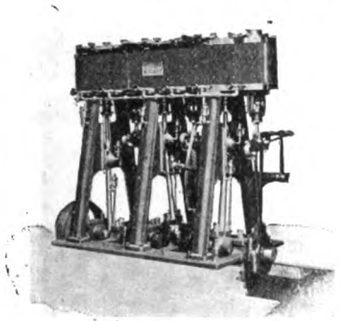

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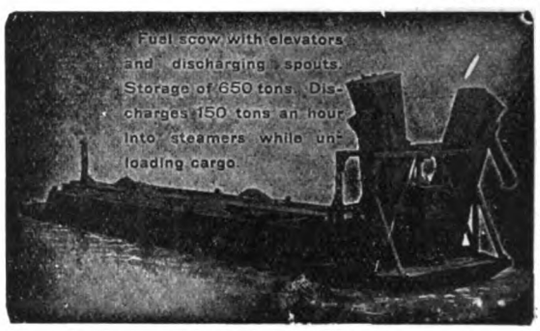
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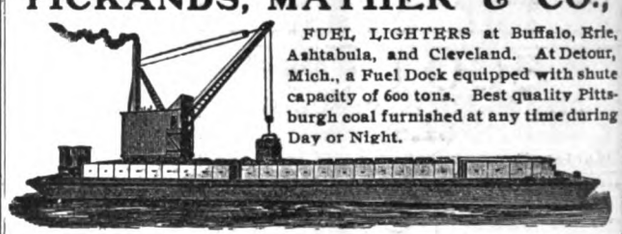

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Poe Lock, from below, closed.
Poe Lock, from below, open.
Poe Lock, from above.
Poe Lock, with Whaleback.
Weitzel Lock, from above.
Weitzel Lock, from below.
Str. North-Land Passing Locks, two views.
Upper Entrance to Lock Canal.
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Fleming & Co., P. H. .....Chicago.
Hawgood & Co., W. A. .....Cleveland.
Helm & Co., D. T. .....Duluth.
Hutchinson & Co. .....Cleveland.
McCarthy, T. R. .....Montreal.
McCurdy, Geo. L. .....Chicago.
Mitchell & Co. ..... Cleveland.
Peck, Chas. E. & W. F. ..New York and Chicago.
Richardson, W. C. ..... Cleveland.
Sullivan, D. & Co.....Chicago.
Weeks, F. H. ..... New York.

IRON ORE AND PIG IRON.

Bourne-Fuller Co. .....Cleveland.
Hanna, M. A. & Co.....Cleveland.
Pickands, Mather & Co.....Cleveland.

LAUNCHES—STEAM, NAPHTHA, ELECTRIC.

Marine Construction & D. D. Co.....
.....Mariner's Harbor, S. I., N. Y.
Truscott Boat Mfg. Co.....St. Joseph, Mich.
Warrington Iron Works.....Chicago.
Willard, Chas. P. .....Chicago.

LIFE FLOATS.

Carley Life Float Co. .....New York.

LIFE PRESERVERS, LIFE BOATS, BUOYS.

Armstrong Cork Co. .....Pittsburg.
Carley Life Float Co..... New York
Drein, Thos. & Son .....Wilmington, Del.
Kahnweiler's Sons, D. .....New York.
Lane & DeGroot .....Long Island City, N. Y.
Marine Construction & Dry Dock Co.....
.....Mariner's Harbor, S. I., N. Y.
Rippley Hardware Co ..... Grafton, Ill.

LIGHTS, SIDE AND SIGNAL.

Helvig, H. A. J. .....New York.
Russell & Watson .....Buffalo.

LOGS.

Bliss, John & Co..... ..... New York.
Nicholson Ship Log Co. .....Cleveland.
Walker & Sons, Thomas .....Birmingham, Eng.
Also Ship Chandlers.

LUBRICATING GRAPHITE.

Dixon Crucible Co., Joseph.....Jersey City, N. J.
United States Graphite Co ..... Saginaw, Mich.

LUMBER.

Martin-Barriss Co. .....Cleveland.
Moran Bros. Co.....Seattle, Wash.
Shurick, F. S. .....New York.

MACHINISTS.

Chase Machine Co.....Cleveland.
Lockwood Mfg Co .....East Boston, Mass.
Macbeth Iron Co.....Cleveland.
Union Machine & Boiler Co. .....Cleveland.

MACHINE TOOLS (WOOD WORKING).

Atlantic Works, Inc. .....Philadelphia.

MARINE RAILWAYS, BUILDERS OF

Crandall & Son, H. I. .....East Boston, Mass.

MATTRESSES, CUSHIONS, BEDDING.

Fogg, M. W. .....New York.

MECHANICAL DRAFT FOR BOILERS.

American Ship Building Co.....Cleveland.
Bloomsburg & Co., H. .....Baltimore, Md.
Detroit Ship Building Co.....Detroit.
Sturtevant, B. F. Co.....Boston.

METALLIC PACKING.

Hayden Mfg. Co., N. L. .....Columbus, O.
Katzenstein, L. & Co. .....New York.
U. S. Metallic Packing Co. .....Philadelphia.

METAL POLISH.

Bertram's Oil Polish Co.....Boston.

MOTORS, GENERATORS—ELECTRIC.

Electro-Dynamic Co.....Philadelphia.
Elwell-Parker Electric Co.....Cleveland.
General Electric Co.....Schenectady, N. Y.
Sturtevant, B. F. Co.....Boston
Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

NAUTICAL INSTRUMENTS.

Bliss, John & Co. .....New York.
Ritchie, E. S. & Sons .....Brookline, Mass.

NAUTICAL SCHOOLS.

Chicago Nautical School..... .....Chicago.
Seattle Nautical School.....Seattle, Wash.

NAVAL ARCHITECTS.

Gaskin, Edward .....Buffalo.
Kidd, Joseph ..... Duluth, Minn.
Logan, Robert ..... Cleveland.
Matteson & Drake.....Philadelphia.
Mosher, Chas. D.....New York.
Newman, R. L. ..... New York.
Sadler, Perkins & Field .....New York.
Wood, W. J. .....Chicago.

OAKUM.

DeGrauw, Aymar & Co. .....New York.
Stratford Oakum Co. .....Jersey City, N. J.

OIL FOR PAINTING.

Sipe & Co., James B.....Allegheny, Pa.

OILS AND LUBRICANTS.

Dixon Crucible Co., Joseph .....Jersey City, N. J.
Standard Oil Co.. .....Cleveland.
United States Graphite Co.....Saginaw, Mich.

PACKING.

Crane Co. .....Chicago.
Hayden Mfg. Co., N. L. .....Columbus, O.
Jenkins Bros. .....New York.
Katzenstein, L. & Co. .....New York.
New York Belting & Packing Co. .....New York.
United States Metallic Packing Co...Philadelphia.

PAINTS.

Baker, Howard H. & Co.....Buffalo.
Detroit Varnish Co. ..... Detroit.
Detroit White Lead Works.....Detroit.
Mohawk Paint & Chemical Co.....Norwich, Conn.
New Jersey Zinc Co. ..... New York.
Sipe & Co., James B.....Allegheny, Pa.
United States Graphite Co.....Saginaw, Mich.
Upson-Walton Co. .....Cleveland.

PATENT ATTORNEYS.

Thurston & Bates .....Cleveland.

PATTERN SHOP MACHINERY.

Atlantic Works, Inc. .....Philadelphia.

PIPE—BRASS AND COPPER, IRON PIPE SIZE.

Waterbury Brass Co. .....New York.

PIPE-JOINT COMPOUND.

United States Graphite Co ..... Saginaw, Mich.

PIPE, WROUGHT IRON.

Bourne-Fuller Co. .....Cleveland.
Crane Co. .....Chicago.
Macbeth Iron Co.....Cleveland.

PLANING MILL MACHINERY.

Atlantic Works, Inc. .....Philadelphia.

PLATES—SHIP, STRUCTURAL, ETC.

Bourne-Fuller Co..... Cleveland.

PLUMBING, MARINE.

Reilly Repair & Supply Co., James....New York.
Sands, Alfred B. & Son.....New York.

PNEUMATIC TOOLS.

Allen, John F. .....New York.

POLISH FOR METALS.

Bertram's Oil Polish Co.....Boston.

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BUYERS' DIRECTORY OF THE MARINE TRADE.—Continued.

PRESSURE REGULATORS.

Kieley & Mueller .....New York.
Ross Valve Co. .....Troy, N. Y.

PROPELLER WHEELS.

American Ship Building Co.....Cleveland.
Atlantic Works.....East Boston, Mass.
Bath Iron Works, Ltd.....Bath, Me.
Cramp, Wm. & Sons.....Philadelphia.
Crescent Ship Yard Co.....Elizabethport, N. J.
Detroit Ship Building Co.....Detroit.
Fore River Ship & Engine Co.....Quincy, Mass.
Great Lakes Engineering Works.....Detroit.
Hyde Windlass Co. .....Bath, Me.
Jenks Ship Building Co.....Port Huron, Mich.
Lockwood Mfg. Co.....East Boston, Mass.
Macbeth Iron Co.....Cleveland.
Maryland Steel Co.....Sparrow's Point, Md.
Milwaukee Dry Dock Co.....Milwaukee.
Moran Bros. Co.....Seattle, Wash.
Newport News Ship Building Co Newport News, Va.
Phosphor Bronze Smelting Co., Ltd. ..Philadelphia.
Risdon Iron Works.....San Francisco.
Roelker, H. B. .....New York.
Sheriffs Mfg. Co. .....Milwaukee.
Superior Shipbuilding Co ..... Superior, Wis.
Thropp & Sons Co., J. E. .....Trenton, N. J.
Trout, H. G. .....Buffalo.
United States Ship Building Co.....New York.

PROJECTORS, ELECTRIC.

Elwell-Parker Electric Co.....Cleveland.
General Electric Co.....Schenectady, N. Y.
Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

PUMPS FOR VARIOUS PURPOSES.

Blake, Geo. F., Mfg. Co.....New York.
Great Lakes Engineering Works.....Detroit.
Kingsford Foundry & Machine Wks. Oswego, N. Y.
"Long-Arm" System Co.....Cleveland.

PUNCHES, RIVETERS, SHEARS.

Allen, John F.....New York.

REFRIGERATING APPARATUS.

Roelker, H. B. .....New York.

REGISTER FOR CLASSIFICATION OF VESSELS.

Great Lakes Register .....Cleveland
Record of American & Foreign Shipping.New York.

RELEASING HOOKS FOR DETACHING BOATS.

Standard Automatic Releasing Hook Co. New York.

RIVETING MACHINES.

Allen, John F.....New York.

RIVETS, STEEL, FOR SHIPS AND BOILERS.

Bourne-Fuller Co. .....Cleveland.

RANGES.

Russell & Watson .....Buffalo.

RIVETS—BRASS AND COPPER.

Waterbury Brass Co. .....New York.

SAFETY VALVES.

American Steam Gauge Co. .....Boston.
Ashton Valve Co. .....Boston.
Crane Co ..... Chicago.
Hayden Mfg. Co., N. L. .....Columbus, O.
Lunkenheimer Co.....Cincinnati.

SAIL MAKERS.

Baker, Howard H. & Co. .....Buffalo.
Upson-Walton Co. .....Cleveland.
Wilson & Silsby .....Boston.

SALVAGE COMPANIES.

See Wrecking Companies.

SCHOOLS, NAUTICAL.

Chicago Nautical School..... Chicago.
Seattle Nautical School.....Seattle, Wash.

SEARCH LIGHTS.

Elwell-Parker Electric Co.....Cleveland.
General Electric Co.....Schenectady, N. Y.
Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

SHEARS.

See Punches, Rivets, and Shears.

SHIP AND BOILER PLATES AND SHAPES.

Bourne-Fuller Co. .....Cleveland.

SHIP BUILDERS.

American Ship Building Co.....Cleveland.
Atlantic Works.....East Boston, Mass.
Bath Iron Works, Ltd.....Bath, Me.
Buffalo Dry Dock Co.....Buffalo.
Cramp, Wm. & Sons.....Philadelphia.
Craig Ship Building Co.....Toledo, O.
Chicago Ship Building Co.....Chicago.
Crescent Ship Yard Co.....Elizabethport, N. J.
Detroit Ship Building Co. .....Detroit.
Fore River Ship & Engine Co. .....Quincy, Mass.
Great Lakes Engineering Works.....Detroit.
Jenks Ship Building Co.....Port Huron, Mich.
Lockwood Mfg. Co.....East Boston, Mass.
Manitowoc Dry Dock Co. .....Manitowoc, Wis.
Marine Construction & Dry Dock Co.....
.....Mariner's Harbor, S. I., N. Y.
Maryland Steel Co.....Sparrow's Point, Md.
Milwaukee Dry Dock Co.....Milwaukee.
Moran Bros. Co.....Seattle, Wash.
Newport News Ship Building Co Newport News, Va.
Risdon Iron Works.....San Francisco.
Roach's Ship Yard .....Chester, Pa.
Shipowners Dry Dock Co. .....Chicago.
Smith & Son, Abram .....Algonac, Mich.
United States Ship Building Co.....New York.
Warrington Iron Works.....Chicago.
Willard, Chas. P. & Co.....Chicago.

SHIP CHANDLERS.

Baker, Howard H. & Co. .....Buffalo.
Moran Bros. Co.....Seattle, Wash.
Reilly Repair & Supply Co., James....New York.
Upson-Walton Co. .....Cleveland.

SHIP LANTERNS AND LAMPS.

Helvig, H. A. J. .....New York.
Russell & Watson .....Buffalo.

SHIP TIMBER.

Martin-Barriss Co. .....Cleveland.
Moran Bros. Co.....Seattle, Wash.
Shurick, F. S. ..... New York.

SMOOTH-ON COMPOUND, FOR REPAIRS.

Smooth-On Mfg. Co. .....Jersey City, N. J.

SPARS—LARGE SIZES.

Moran Bros. Co.....Seattle, Wash.

STAYBOLTS, IRON OR STEEL, HOLLOW, OR SOLID.

Falls Hollow Staybolt Co.....Cuyahoga Falls, O.

STEAM VESSELS FOR SALE.

Elwell, Jas. W. & Co. .....New York.
Holmes, Samuel .....New York.
King, Rufus S. .....New York.
McCarthy, T. R. .....Montreal, Can.
Newman, R. L. .....New York.
Weeks, F. H. .....New York.

STEAMSHIP LINES, PASS. AND FREIGHT.

American Line .....New York.
Cleveland & Buffalo Transit Co. .....Cleveland.
Erie & Western Trans. Co. .....Buffalo.
Goodrich Trans. Co. .....Chicago.
International Mercantile Marine Co .. Philadelphia.
Pere Marquette R. R. & S. S. Line.....Milwaukee.
Red Star Line .....New York.

STEEL CASTINGS.

Seaboard Steel Casting Co. .....Chester, Pa.
Macbeth Iron Co.....Cleveland.

STEERING APPARATUS.

American Ship Building Co.....Cleveland.
Chase Machine Co.....Cleveland.
Dake Engine Co. .....Grand Haven, Mich.
Detroit Ship Building Co.....Detroit.
Electro-Dynamic Co.....Philadelphia.
Hyde Windlass Co. .....Bath, Me.
Jenks Ship Building Co.....Port Huron, Mich.
Moulton Steering Engine Co..... ... New York.
Sheriffs Mfg. Co. .....Milwaukee.

STOCKS, BONDS, SECURITIES.

Fahey & Co. .....Cleveland.

SUBMARINE DIVING APPARATUS.

Morse & Son, A. J. .....Boston.
Schrader's Son, A. .....New York.

SURVEYORS, MARINE.

Gaskin, Edward .....Buffalo.
Matteson & Drake ... .Philadelphia.
Newman, R. L. .....New York.
Wood, W. J. .....Chicago.

TESTS OF MATERIALS.

Hunt, Robert W. & Co. .....Chicago.
Pittsburg Testing Laboratory Ltd. .....Pittsburg.

TILING, INTERLOCKING RUBBER.

New York Belting & Packing Co. .....New York.

TOOLS, METAL WORKING, FOR SHIP AND ENGINE WORKS.

Allen, John F. .....New York.
Watson-Stillman Co. .....New York.

TOOLS, WOOD WORKING.

Atlantic Works, Inc. .....Philadelphia.

TOWING MACHINES.

American Ship Windlass Co.....Providence, R. I.
Chase Machine Co. .....Cleveland.

TOWING COMPANIES.

Donnelly Salvage & Wrecking Co....Kingston, Ont.
Midland Towing & Wrecking Co., Ltd.Midland, Ont.

TRAPS, STEAM.

Kieley & Mueller .....New York.
Lunkenheimer Co. ..... Cincinnati.
Sturtevant Co., B. F., Jamaica Plain.....Boston.

TRUCKS.

Boston & Lockport Block Co. .....Boston.

TUBING, SEAMLESS.

Shelby Steel Tube Co. .....Pittsburg, Pa.
Waterbury Brass Co.....New York.

VALVES, STEAM SPECIALTIES, ETC.

American Steam Gauge Co. .....Boston.
Ashton Valve Co. .....Boston.
Bordo, L. J. .....Philadelphia.
Crane Co. .....Chicago.
Hayden Mfg. Co., N. L. .....Columbus, O.
Jenkins Bros. .....New York.
Kieley & Mueller .....New York.
Lunkenheimer Co. ..... Cincinnati.
Ross Valve Co. .....Troy, N. Y.

VALVES FOR WATER AND GAS.

Ross Valve Co. .....Troy, N. Y.

VARNISHES.

Detroit Varnish Co..... .... Detroit.
Detroit White Lead Works..... Detroit.
New Jersey Zinc Co.....New York.
Also Ship Chandlers.

VESSEL AND FREIGHT AGENTS.

Boland, John J. .....Buffalo.
Brown & Co. .....Buffalo.
Elwell, Jas. W. & Co. .....New York.
Elphicke, C. W. & Co. .....Chicago.
Fleming & Co., P. H. .....Chicago.
Hall & Root .....Buffalo.
Helm & Co., D. T.....Duluth.
Hawgood & Co., W. A. .....Cleveland.
Holmes, Samuel .....New York.
Hutchinson & Co. .....Cleveland.
King, Rufus S. .....New York.
McCarthy, T. R. .....Montreal.
Newman, R. L.....New York.
Mitchell & Co. ..... Cleveland
Richardson, W. C. .....Cleveland.
Sullivan, D. & Co. .....Chicago.
Weeks, F. H. .....New York.

VENTILATING APPARATUS FOR SHIPS.

Sturtevant, B. F. Co. .....Boston.

WIRE—BRASS AND COPPER.

Waterbury Brass Co. .....New York.

WIRE ROPE AND WIRE ROPE FITTINGS.

Baker, H. H. & Co. .....Buffalo.
DeGrauw, Aymar & Co. .....New York.
Upson-Walton Co. .....Cleveland.

WHISTLES, STEAM.

American Steam Gauge Co. .....Boston.
Ashton Valve Co. .....Boston.
Lunkenheimer Co. ..... Cincinnati.

WHITE METAL—SHEETS, RODS AND WIRE.

Waterbury Brass Co. .....New York.

WINDLASSES.

American Ship Windlass Co.....Providence, R. I.
American Ship Building Co. .....Cleveland.
Hyde Windlass Co. .....Bath, Me.
Jenks Ship Building Co. .....Port Huron, Mich.

WINCHES.

American Ship Windlass Co.....Providence, R. I.
Hyde Windlass Co. .....Bath, Me.

WOOD WORKING MACHINERY.

Atlantic Works, Inc. .....Philadelphia.

WRECKING AND SALVAGE COMPANIES.

Donnelly Salvage & Wrecking Co...Kingston, Ont.
Midland Towing & Wrecking Co., Ltd..Midland, Ont.

YACHT AND BOAT BUILDERS.

Drein, Thos. & Son .....Wilmington, Del.
Lane & DeGroot .....Long Island City, N. Y.
Marine Construction & Dry Dock Co.....New York.
Ripley Hardware Co..... Grafton, Ill.
Truscott Boat Mfg Co.....St. Joseph, Mich.
Warrington Iron Works.....Chicago.
Willard, Chas. P. & Co.....Chicago.

YAWLS.

Drein, Thos. & Son .....Wilmington, Del.
Lane & DeGroot.....Long Island City, N. Y.

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ALPHABETICAL INDEX OF ADVERTISERS IN THE MARINE REVIEW AND MARINE RECORD.

The star (*) indicates that the advertisement appears alternate weeks. For addresses see advertisements on pages noted.

*Allen, John F. 11
Almy Water Tube Boiler Co.... 15
American Injector Co 10
American Line 3
American Ship Building Co..... 1
American Ship Masters Ass'n... 8
American Ship Windlass Co..... 2
American Steam Gauge Co..... 1
Anchor Line 45
Armstrong Cork Co..... 48
Ashton Valve Co..... 16
Atlantic Works 5
*Atlantic Works, Inc..... 11
Audel & Co., Theo..... 47

Babcock & Wilcox Co..... 15
Baldt Anchor Co..... 9
Baker, Howard H. & Co..... 48
Bartlett & Snow Co., C. O..... 2
Bath Iron Works, Ltd..... 1
Bertram's Oil Polish Co..... 1
Blake, Geo. F., Mfg. Co..... 9
*Bliss, John & Co..... 13
*Bloomsburg & Co., H..... 9
Boland, J. J..... 40
Bordo, L. J..... 13
*Boston & Lockport Block Co.... 32
Bourne-Fuller Co. 16
Bowers, L. M. & Co..... 9
*Boyer's, L. Sons 48
Brown, Harvey L. 40
Brown & Co. 40
Brown Hoisting Machinery Co., Inc. 2
Buffalo Dredging Co. 37
Buffalo Dry Dock Co..... 46

Chase Machine Co. 7
*Chelsea Clock Co..... 3
Chicago & Gt. L. Dredge & Dock Co. 37
Chicago Nautical School..... 37
Chicago Ship Building Co..... 46
Cleveland & Buffalo Transit Co.. 45
Cleveland City Forge & Iron Co.. 48
Cleveland Trust Co. 36
Continental Iron Works 2
Cory, Chas. & Son 12
*Craig Ship Building Co..... 13
Cramp, Wm. & Sons, S. & E. B. Co. 1
*Crandall & Son, H. I. 11
Crane Co. 4-7
Crescent Ship Yard Co..... 4

Dake Engine Co. 12
Dearborn Drug & Chemical Wks. 14
DeGrauw, Aymar & Co..... 9
Delauney, Belleville & Co..... 31
Delaware River Iron S. B. & E. Works. 5
Detroit Ship Building Co..... 1
Detroit White Lead Works 1
Dixon Crucible Co., Joseph..... 12
Donnelly Salvage & Wrecking Co. 8
Dreln, Thos. & Son..... 4

Electro-Dynamic Co 1
Elphicke, C. W. & Co..... 40
Elwell, Jas. W., & Co..... 40
Elwell-Parker Electric Co. 2
Erie & Western Trans. Co. 45

Fahey & Co. 30
Falls Hollow Staybolt Co..... 4
Faust, Wm. H..... 40
Federal Trust Co. 36
Fix's S., Sons 37
Fleming & Co., P. H..... 40
Fletcher, W. & A. Co..... 4
Fogg, M. W. 38
Fore River Ship & Engine Co.... 5
Forest City Boiler Co 37

Garrett-Cromwell Engineering Co. 3
Gaskin, Edward 40
General Electric Co. 16
Gilchrist, Albert J. 40
Goodrich Trans. Co..... 41
Goulder, Holding & Masten..... 40
Great Lakes Engineering Works. 34
Great Lakes Register 8

Hall & Root 40
Hanna, M. A. & Co..... 38
Hardy, Wm. A. 14
Hawgood & Co., W. A..... 40
Hayden Mfg. Co., N. L..... 37
Helm & Co., D. T..... 40
Helvig, H. A. J..... 3
Herriman, F. D. 7
Holmes, Samuel 40
Hoyt, Dustin & Kelley 40
Hunt, Robert W. & Co..... 41
Hutchinson & Co. 40
Hyde Windlass Co. 48

International Mercantile Marine Co. 3
Ironville Dock & Coal Co. 38

Jenkins Brothers 16
Jenks Ship Building Co..... 47

Kahnweiler's Sons, David..... 4
Katzenstein, L. & Co..... 3
Kidd, Joseph 40
*Kieley & Mueller..... 13
Kingsford Foundry & Machine Works 14
King, Rufus S. 40
Kremer, C. E. 40

Lake Erie Dredging Co..... 37
Lane & DeGroot 4
*Learmonth, Robert 3
Lidgerwood Mfg. Co. 6
Lockwood Mfg. Co. 5
Logan, Robert 41
L. S. & M. S. Ry..... 45
Lunkenheimer Co. 12

McCarthy, T. R. 40
McCurdy, Geo. L. 8
McCutcheon, C. H. 13
Macbeth Iron Co. 48
MacDonald, Ray G. 46
MacLean Hydraulic Signal Co..... 6
Manitowoc Dry Dock Co. 5
Marine Construction & Dry Dock Co. 5
*Marine Iron Co. 38
Martin-Barriss Co. 9
Maryland Steel Co. 5
Matteson & Drake..... 41
Midland Towing & Wrecking Co., Ltd. 48
Milwaukee Dry Dock Co. 46
Mitchell & Co. 40
Mohawk Paint & Chemical Co... 7
*Moran Bros. Co. 47
Morse & Son, A. J. 38
Mosher, Chas. D. 41
Moulton Steering Engine Co..... 13

Newman, R. L. 40
Newport News Ship Building & Dry Dock Co. 4
New Jersey Zinc Co. 7
New York Belting & Packing Co. 10
Nicholson Ship Log Co..... 13
North River Iron Works 4
Northwestern Steam Boiler & Mfg. Co. 14

Peck, Chas. E. & W. F..... 8
Penberthy Injector Co..... 10
Pere Marquette R. R. & S. S. Line 45
Phosphor Bronze Smelting Co. Ltd. 14
Pickands, Mather & Co. 38
Pinney & Warner 40
Pittsburg Coal Co. 39
Pittsburg Testing Laboratory, Ltd. 41
Pittsburg White Metal Co..... 33
Potter, J. D..... 3
Powell, Ambrose V. 41

Record of American & Foreign Shipping 8
Red Star Line 3
Richardson, W. C. 40
*Reilly Repair & Supply Co., Jas. 9
*Ripley Hardware Co..... 32
Risdon Iron Works 5
*Ritchie & Sons, E. S..... 13
Roach's Ship Yard 5
Roberts Water Tube Boiler Co.. 15
Rochester & Pittsburg Coal & Iron Co. 39
Roelker, H. B. 5
Ross Valve Co. 12
Russell & Watson .....

Sadler, Perkins & Field..... 41
Safety Car Heating & Lighting Co. 1
Sands, Alfred B. & Son..... 12
Scherzer Rolling Lift Bridge Co. 9
Schrader's Sons, A. 16
Schwencke, Kirk & Co. 41
Seaboard Steel Casting Co. 32
Seattle Nautical School..... 37
Shaw, Warren, Cady & Oakes.... 40
Shelby Steel Tool Co..... 14
Sheriffs Mfg. Co. 8
Shipowners Dry Dock Co. 16
Shipping World..... 10
Shurick, F. S. 38
Sipe & Co., James B..... 7
*Smith & Son, Abram.....38
Smith Co., L. P. & J. A..... 36
Smith Coal & Dock Co., Stanley B. 39
Smith, Stanley B. & Co..... 39
Smooth-On Mfg. Co. 9
Spencer, H. R. 40
Standard Chain Co. 6
*Standard Oil Co. 13
Standard Releasing Hook Co. .. 9
Stirling Co. 15
Stratford Oakum Co., Geo. 6
Sturtevant, B. F. Co. 48
Sullivan & Co. 40
Superior Ship Building Co..... 46

Taylor Water Tube Boiler Co... 15
Thropp, J. E. & Sons Co..... 37
Thurston & Bates 41
Trout, H. G. 8
Truscott Boat Mfg. Co. 5

Union Machine & Boiler Co..... 38
Upson-Walton Co. 48
U. S. Graphite Co..... 12
U. S. Metallic Packing Co..... 48
U. S. Shipbuilding Co..... 4

Walker, Thomas & Son..... 3
Warrington Iron Works 5
Waterbury Brass Co. 48
*Watson-Stillman Co. 47
Weeks, F. H. 40
Wellman-Seaver-Morgan Co..... 2
Westinghouse Electric & Mfg. Co. 6
White, Johnson, McCaslin & Cannon 40
*Willard, Chas. P. & Co..... 36
Wood, W. J. 40

Youghiogheny & Lehigh Coal Co.. 39

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Detroit.		Mackinac Island.
Sault Ste. Marie.	Marquette.	Houghton.
Hancock.	Duluth.	

FREIGHT SERVICE Steamers.

Alaska.	Codorus.	Mahoning.
Schuylkill.	Conestoga	Clarion.
Delaware.	Juniata.	Lehigh.
Lycoming.	Susquehanna.	Wissahickon.
Conemaugh.		

PORTS OF CALL.

Buffalo.	Erie.	Cleveland.
Detroit.	Sault Ste. Marie.	Marquette.
Houghton.	Hancock.	Duluth.
W. Superior	Chicago.	Milwaukee.

CHAS. E. MARKHAM, General Passenger Agent, Buffalo, N. Y.
J. C. EVANS, Western Manager, Buffalo, N. Y.

LAKE SHORE & MICHIGAN SOUTHERN RY.

Eastward.	Arrive from West	Depart East.
No. 18, Southwestern Lim	.....	1:50am
No. 22, Lake Shore Lim...	*2:12am	*2:20am
No. 20, Chi & Cleve Ex....	*7:20am	.....
No. 26, N Y & Bost Ex ...	*7:40am	*8:00am
No. 40, Toledo & Buff Ac.	†10:00am	†10:40am
No. 32, Fast Mail	*11:25am	*11:30am
No. 44, Ac via Sandusky..	†1:40pm	..
No. 46, Southwestern Ex.	....	*3:00pm
No. 116, Conneaut Accom	.....	†4:30pm
No. 6, Lim Fast Mail....	*5:40pm	*5:45pm
No. 26, 20th Cent Lim. ...	*7:40pm	*7:43pm
No. 10, C., N Y & B Sp....	*7:30pm	*7:50pm
No. 16, New Eng Ex.....	*10:30pm	*10:35pm
No. 2, Day Express.	†9:10pm	†9 25pm
No. 126, Norwalk Accom.	†7:40am	.....

Westward.	Arrive from East.	Depart West.
No. 11, Southwestern Lim	*3:25am	.....
No. 7, Day Express.	.....	†6:00am
No. 15, Bost & Chi Sp.....	*3:05am	*3:15am
No. 19, Lake Shore Lim..	*7:05am	*7:15am
No. 23, Western Express.	*10:30am	*10:35am
No. 29, Southwestern Sp.	‡11:10am	.....
No. 33, Southwestern Ex	*12:25pm	.....
No. 133, Cleve & Det Ex..	.....	*12:45pm
No. 47 Accomodation.....	†11.00am	†3:00pm
No. 141, Sandusky Accom.	.....	†3:10pm
No. 43, Fast Mail	*4:35pm	*4:40pm
No. 127, Norwalk Accom..	.....	†5:10pm
No. 37, Pacific Express...	*7:00pm	*7:20pm
No. 3, Fast Mail Lim.....	*10:50pm	*10:55pm
No. 115, Conneaut Accom.	*8:30am	.....

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ALPHABETICAL INDEX OF ADVERTISERS IN THE MARINE REVIEW AND MARINE RECORD.

The star (*) indicates that the advertisement appears alternate weeks. For addresses see advertisements on pages noted.

*Allen, John F. 11
Almy Water Tube Boiler Co.... 15
American Injector Co 10
American Line 3
American Ship Building Co..... 1
American Ship Masters Ass'n... 8
American Ship Windlass Co..... 2
American Steam Gauge Co..... 1
Anchor Line 45
Armstrong Cork Co..... 48
Ashton Valve Co..... 16
Atlantic Works 5
*Atlantic Works, Inc..... 11
Audel & Co., Theo..... 47

Babcock & Wilcox Co..... 15
Baldt Anchor Co..... 9
Baker, Howard H. & Co..... 48
Bartlett & Snow Co., C. O..... 2
Bath Iron Works, Ltd..... 1
Bertram's Oil Polish Co..... 1
Blake, Geo. F., Mfg. Co..... 9
*Bliss, John & Co..... 13
*Bloomsburg & Co., H..... 9
Boland, J. J..... 40
Bordo, L. J..... 18
*Boston & Lockport Block Co.... 32
Bourne-Fuller Co. 16
Bowers, L. M. & Co..... 9
*Boyer's, L. Sons 48
Brown, Harvey L. 40
Brown & Co. 40
Brown Hoisting Machinery Co., Inc. 2
Buffalo Dredging Co. 37
Buffalo Dry Dock Co..... 46

Chase Machine Co. 7
*Chelsea Clock Co..... 3
Chicago & Gt. L. Dredge & Dock Co. 37
Chicago Nautical School..... 37
Chicago Ship Building Co..... 46
Cleveland & Buffalo Transit Co.. 45
Cleveland City Forge & Iron Co.. 48
Cleveland Trust Co. 36
Continental Iron Works 2
Cory, Chas. & Son 12
*Craig Ship Building Co..... 13
Cramp, Wm. & Sons, S. & E. B. Co. 1
*Crandall & Son, H. I. 11
Crane Co. 4-7
Crescent Ship Yard Co..... 4

Dake Engine Co. 12
Dearborn Drug & Chemical Wks. 14
DeGrauw, Aymar & Co..... 9
Delauney, Belleville & Co..... 31
Delaware River Iron S. B. & E. Works. 5
Detroit Ship Building Co..... 1
Detroit White Lead Works 1
Dixon Crucible Co., Joseph..... 12
Donnelly Salvage & Wrecking Co. 8
Drein, Thos. & Son..... 4

Electro-Dynamic Co 1
Elphicke, C. W. & Co..... 40
Elwell, Jas. W., & Co..... 40
Elwell-Parker Electric Co. 2
Erie & Western Trans. Co. 45

Fahey & Co. 30
Falls Hollow Staybolt Co..... 4
Faust, Wm. H..... 40
Federal Trust Co. 36
Fix's S., Sons 37
Fleming & Co., P. H..... 40
Fletcher, W. & A. Co..... 4
Fogg, M. W. 38
Fore River Ship & Engine Co.... 5
Forest City Boiler Co 37

Garrett-Cromwell Engineering Co. 3
Gaskin, Edward 40
General Electric Co. 16
Gilchrist, Albert J. 40
Goodrich Trans. Co..... 41
Goulder, Holding & Masten..... 40
Great Lakes Engineering Works. 34
Great Lakes Register 8

Hall & Root 40
Hanna, M. A. & Co..... 38
Hardy, Wm. A. 14
Hawgood & Co., W. A..... 40
Hayden Mfg. Co., N. L..... 37
Helm & Co., D. T..... 40
Helvig, H. A. J..... 3
Herriman, F. D. 7
Holmes, Samuel 40
Hoyt, Dustin & Kelley 40
Hunt, Robert W. & Co..... 41
Hutchinson & Co. 40
Hyde Windlass Co. 48

International Mercantile Marine Co. 3
Ironville Dock & Coal Co. 38

Jenkins Brothers 16
Jenks Ship Building Co..... 47

Kahnweiler's Sons, David..... 4
Katzenstein, L. & Co..... 3
Kidd, Joseph 40
*Kieley & Mueller..... 13
Kingsford Foundry & Machine Works 14
King, Rufus S. 40
Kremer, C. E. 40

Lake Erie Dredging Co..... 37
Lane & DeGroot 4
*Learmonth, Robert 3
Lidgerwood Mfg. Co. 6
Lockwood Mfg. Co. 5
Logan, Robert 41
L. S. & M. S. Ry..... 45
Lunkenheimer Co. 12

McCarthy, T. R. 40
McCurdy, Geo. L. 8
McCutcheon, C. H. 13
Macbeth Iron Co. 48
MacDonald, Ray G. 40
MacLean Hydraulic Signal Co..... 6
Manitowoc Dry Dock Co. 5
Marine Construction & Dry Dock Co. 5
*Marine Iron Co. 38
Martin-Barriss Co. 9
Maryland Steel Co. 5
Matteson & Drake..... 41
Midland Towing & Wrecking Co., Ltd. 48
Milwaukee Dry Dock Co. 46
Mitchell & Co. 40
Mohawk Paint & Chemical Co... 7
*Moran Bros. Co. 47
Morse & Son, A. J. 33
Mosher, Chas. D. 41
Moulton Steering Engine Co..... 18

Newman, R. L. 40
Newport News Ship Building & Dry Dock Co. 4
New Jersey Zinc Co. 7
New York Belting & Packing Co. 10
Nicholson Ship Log Co..... 13
North River Iron Works 4
Northwestern Steam Boiler & Mfg. Co. 14

Peck, Chas. E. & W. F..... 8
Penberthy Injector Co..... 10
Pere Marquette R. R. & S. S. Line 45
Phosphor Bronze Smelting Co. Ltd. 14
Pickands, Mather & Co. 38
Pinney & Warner 40
Pittsburg Coal Co. 39
Pittsburg Testing Laboratory, Ltd. 41
Pittsburg White Metal Co..... 33
Potter, J. D..... 3
Powell, Ambrose V. 41

Record of American & Foreign Shipping 8
Red Star Line 3
Richardson, W. C. 40
*Reilly Repair & Supply Co., Jas. 9
*Rippley Hardware Co..... 32
Risdon Iron Works 5
*Ritchie & Sons, E. S..... 13
Roach's Ship Yard 5
Roberts Water Tube Boiler Co.. 15
Rochester & Pittsburg Coal & Iron Co. 39
Roelker, H. B. 5
Ross Valve Co. 12
Russell & Watson .....

Sadler, Perkins & Field..... 41
Safety Car Heating & Lighting Co. 1
Sands, Alfred B. & Son..... 12
Scherzer Rolling Lift Bridge Co. 9
Schrader's Sons, A. 16
Schwencke, Kirk & Co. 41
Seaboard Steel Casting Co. 32
Seattle Nautical School..... 37
Shaw, Warren, Cady & Oakes.... 40
Shelby Steel Tool Co..... 14
Sheriffs Mfg. Co. 8
Shipowners Dry Dock Co. 16
Shipping World..... 10
Shurick, F. S. 33
Sipe & Co., James B..... 7
*Smith & Son, Abram.....38
Smith Co., L. P. & J. A..... 36
Smith Coal & Dock Co., Stanley B. 39
Smith, Stanley B. & Co..... 39
Smooth-On Mfg. Co. 9
Spencer, H. R. 40
Standard Chain Co. 6
*Standard Oil Co. 13
Standard Releasing Hook Co. .. 9
Stirling Co. 15
Stratford Oakum Co., Geo. 6
Sturtevant, B. F. Co. 48
Sullivan & Co. 40
Superior Ship Building Co..... 46

Taylor Water Tube Boiler Co... 15
Thropp, J. E. & Sons Co..... 37
Thurston & Bates 41
Trout, H. G. 8
Truscott Boat Mfg. Co. 5

Union Machine & Boiler Co..... 38
Upson-Walton Co. 48
U. S. Graphite Co..... 12
U. S. Metallic Packing Co..... 48
U. S. Shipbuilding Co..... 4

Walker, Thomas & Son..... 3
Warrington Iron Works 5
Waterbury Brass Co. 48
*Watson-Stillman Co. 47
Weeks, F. H. 40
Wellman-Seaver-Morgan Co..... 2
Westinghouse Electric & Mfg. Co. 6
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*Willard, Chas. P. & Co..... 36
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No. 22, Lake Shore Lim...	*2:12am	*2:20am
No. 20, Chi & Cleve Ex....	*7:20am	.....
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No. 29, Southwestern Sp.	‡11:10am	.....
No. 33, Southwestern Ex	*12:25pm	.....
No. 133, Cleve & Det Ex..	.....	*12:45pm
No. 47 Accomodation.....	†11.00am	†3:00pm
No. 141, Sandusky Accom.	.....	†3:10pm
No. 43, Fast Mail	*4:35pm	*4:40pm
No. 127, Norwalk Accom..	.....	†5:10pm
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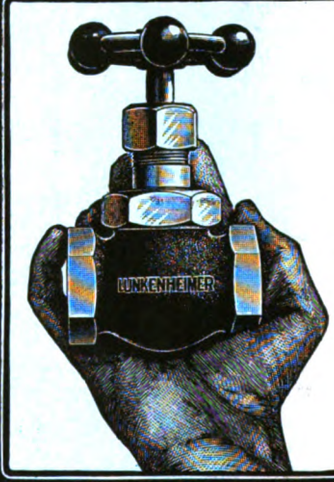

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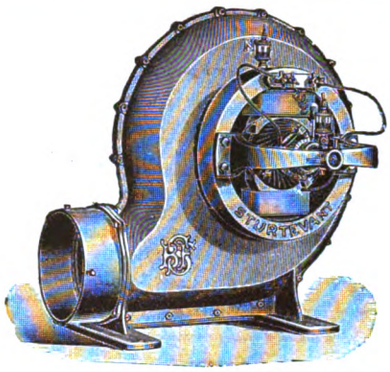

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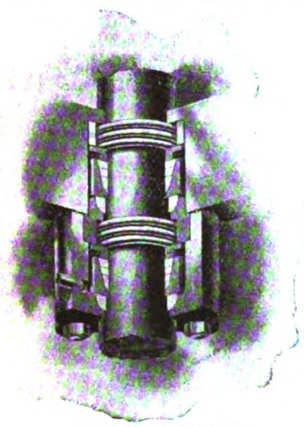

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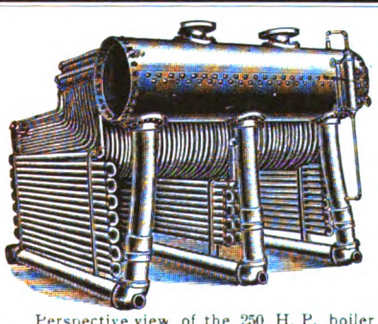

Perspective view of the 250 H. P. boiler built for the steam freighter "Clara," having 6 ft. space and 8 ft. length; 34.4 sq. ft. of grate area and 1,900 sq. ft. heating surface; weight of boiler and water, 14,000 lbs. Replaced a return tubular boiler, thereby saving in dead-weight of boiler and water, 16½ tons. The Clara now has 14 in. less draft and an increased earning capacity of $10 per day.

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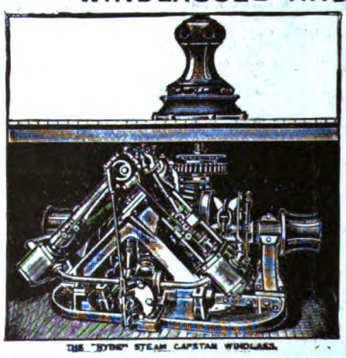

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